



Heating technology since 1959

# ***Instruction Manual*** ***for model***

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## **RK 34 /B**

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*Premix condensing system boiler  
for remote D.H.W. storage cylinder connection*



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# 1. GENERAL INFORMATION

## 1.1 General warnings

-  Professionally qualified personnel in accordance with current laws and standards and in line with the manufacturer's instructions must install the appliance.
-  With 'Professionally qualified personnel' is intended a personnel with technical knowledge in the field of installation and maintenance of components for central heating and domestic hot water production systems for domestic and industrial use.
-  The appliance must be used solely for the purpose for which it has been designed and manufactured: central heating and domestic hot water production. Any other use is deemed as improper and as such dangerous. Under no circumstances will the manufacturer be held responsible for damage or injury to persons or animals caused by errors in the installation and/or use of the appliance, or through non-compliance with current local and national standards and/or the manufacturer's instructions.
-  The installation, operation and maintenance manual forms an integral and essential part of the product and must be kept near the appliance always.
-  This manual must be kept in a safe place and made available for any future reference. If the appliance is sold or transferred to a different owner, this must follow the appliance to be read by the new owner and/or installer.
-  The warnings contained in this chapter have been written for the appliance user, the installer and the service engineer.
-  The user manual must be read carefully as it provides information on the operation and the operating limits of the appliance.
-  This appliance must be used exclusively in a pressurised central heating system.
  - After the removal of all the packaging, check that the appliance has not been damaged. In case of doubt, do not attempt to use the product but refer to the supplier. Packing materials (cardboard box, wooden crate, nails, staples, plastic bags, polystyrene, etc.) must not be left within reach of children in that these items represent a potential hazard and must be disposed of in a responsible manner.
  - Before carrying out any cleaning or maintenance operations, disconnect the appliance from the mains electricity supply by switching off at the main switch and/or any other isolating device.
  - Do not obstruct the air intake or flue exhaust grills.
  - Do not obstruct the air intake or flue exhaust terminals.
  - In the case of a fault and/or malfunction in the appliance, shut down the system. Do not interfere with or attempt any repairs. Call for professionally qualified technical assistance only.
  - Any warranty repairs to the appliance must be carried out exclusively by the manufacturer's authorised service centre using original spare parts. Non-compliance with the above requirements may compromise the safety of the appliance and invalidate the warranty. In order to guarantee the efficiency of the appliance and its correct operation, it must be serviced regularly by professionally qualified personnel in line with the manufacturer's instructions.
  - When the appliance is no longer required for use, any parts that may constitute potential sources of danger must be rendered harmless.
  - Only original accessories or optional extras (including electrical parts) must be used with the appliance.
  - Should there be a smell of gas present in the room where the appliance is installed, **DO NOT** attempt to activate any electric switches, telephones or any other equipment that may cause sparks. Open doors and windows immediately to create a current of air and ventilate the room. Shut-off the main gas supply valve (at the meter), or on the cylinder in the case of bottled gas, and call an authorised service centre.
  - **Do not attempt to interfere with the appliance in any way.**

- As dictated by current legislation, this appliance **must be installed exclusively by qualified personnel**. Before starting the boiler for the first time, make sure that it is connected to a water supply and central heating system compatible with its performance characteristics.
- The room must be ventilated by means of an air intake positioned at floor level and protected with a grill. Make sure the grill does not reduce the passage section.
- The air inflow from adjacent rooms is allowed providing that those rooms are in depression with respect to the atmosphere and that **there are not fireplace or fan installed**. When the appliance is installed outdoor, i.e. on balcony or terrace, make sure it is not directly exposed to atmospheric agents to prevent any damage to components which would lead to a warranty invalidation. It is recommended to provide the boiler with a protective casing/box against bad weather conditions.
- **Check the technical data reported on the packing and on the rating plate** located on the inside of the front casing. Also check that the burner is appropriate for the type of gas to burn.
- **Make sure that the pipes and fittings used for the gas service are perfectly tight and that there are no gas leaks.**
- Prior to start-up, the central heating pipes should be flushed to remove any residues that could compromise the operation of the appliance.
- The appliance can be regarded as being electrically safe when it has been connected to an efficient earth system installed in accordance with the requirements of current safety standards. This fundamental safety requirement must be checked and verified. In case of doubt, have the electrical system checked by a qualified electrician. The manufacturer will not be held liable for any damage or injury caused as a result of an ineffective or non-existent earth system.
- The domestic power supply must be checked by a qualified electrician to ensure that it can support the maximum power absorption of the appliance, as indicated on the appliance data plate (positioned on the inside of the front casing). In particular, make sure that the cable ratings are adequate for the power absorbed.
- Do not use adapters; multiple sockets or extension leads to connect the appliance to the mains power supply.
- The appliance must be connected to the mains power supply through an appropriate electrical isolator in accordance with the current wiring regulations.
- When using an electrical appliance, a few fundamental rules must be observed:
  - Do not touch the appliance with damp or wet parts of the body or when barefoot
  - Do not pull on the electric wires
  - Do not leave the appliance exposed to atmospheric elements (rain, sun, etc.) unless these conditions have been expressly provided for.
  - Do not allow the appliance to be used by children or anyone unfamiliar with its operation.
  - The user must not replace the power supply cable.
- If the cable is damaged in any way, switch off the appliance and have the cable replaced by a suitably qualified electrician.
- **When the appliance is no longer required for use, switch off the main power supply, to switch all electrical components off (circulating pump, burner etc.)**

## 1.2 Product conformity

RADIANT BRUCIATORI S.p.A. declares that all its products are manufactured to a high specification and in compliance with the relevant standards.

The materials used such as copper, brass, stainless steel, etc. form a compact, homogeneous, highly functional unit that is easy to install and simple to operate. In its simplicity, the wall-mounted appliance is equipped with all the appropriate accessories required to make it a fully independent boiler capable of satisfying domestic hot water production and central heating needs. All boilers are fully inspected and are accompanied by a quality certificate, signed by the inspector, and a guarantee certificate. This manual must be kept in a safe place and must **accompany the boiler at all times.**

**RADIANT BRUCIATORI S.p.A. will not be held responsible for any misinterpretation of this manual resulting from the inaccurate translation of same.**

**RADIANT BRUCIATORI S.p.A. will not be held responsible for the consequences in the case of non-observance of the instructions contained in this manual or in the case where actions not specifically described herein are undertaken.**

**Radiant Bruciatori S.p.A. declare that no substances harmful to health are contained in the appliance or used during appliance manufacture and have not used or intend to use any of the following substances in the manufacture of Radiant heating products.**

- **Asbestos**
- **Mercury**
- **CFC's.**

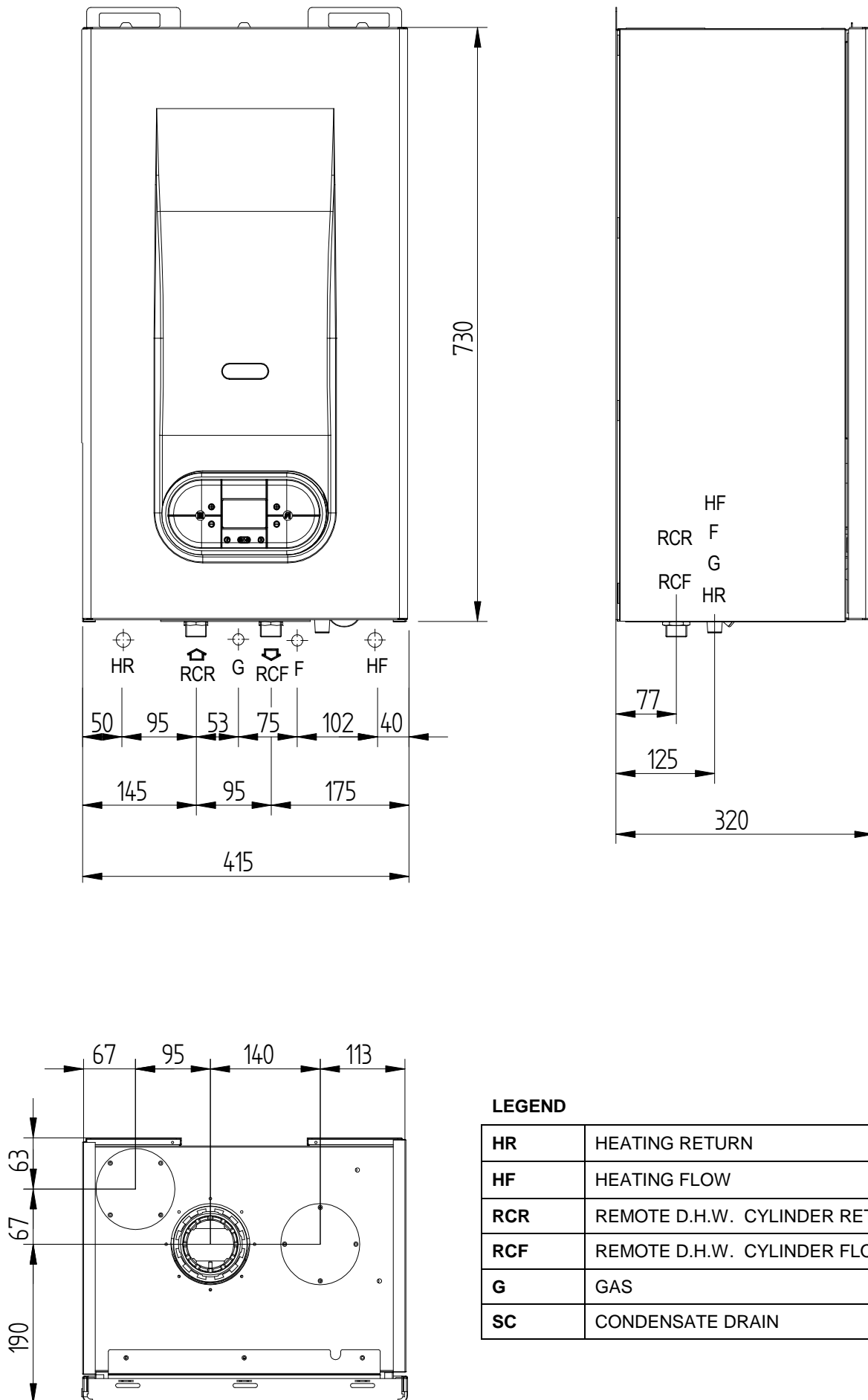
## 2. TECHNICAL CHARACTERISTICS

### 2.1 Technical data

Model		RK 34 /B
CE Certification	n°	0694CO7385
Appliance Type		II2H3B/P
Appliance Category		B23p-B33-C13-C33-C43-C53-C63-C83-C93
Heat Input max	kW	34
Heat Input min	kW	10
Heat Output max (50/30°)	kW	36.24
Efficiency 100% (full load 50/30°)	%	106.6
Efficiency 30% (partial load 50/30°)	%	107.9
Heat Output max - 80/60°C (Non condensing)	kW	9.73
Heat Output min - 80/60°C (Non condensing)	kW	33.42
Efficiency 100% (full load 80/60°)	%	98.3
Efficiency 30% (partial load 80/60°)	%	100.7
GAS DIRECTIVE 92/42/ECC - Efficiency marking	stars	4
NOx	class	5
<b>Central Heating circuit</b>		
Central Heating water temperature setting (min-max)	°C	30-80 / 25-45
Max. heating working temperature	°C	80
Expansion vessel capacity	litres	7
Max. working pressure (heating)	bar	3
Min. working pressure (heating)	bar	0.3
<b>Domestic Hot Water circuit</b>		
D.H.W. temperature setting (min-max)	°C	35-60
Max. Hot water working pressure	bar	6
Min. Hot water working pressure	bar	0.5
<b>Dimensions (Boiler casing size)</b>		
Width	mm	415
Height	mm	730
Depth	mm	320
Weight (net)	kg	42
<b>Hydraulic connections</b>		
Central Heating Flow connection	Ø	3/4"
Central heating Return connection	Ø	3/4"
Central heating flow connection to DHW storage cylinder	Ø	3/4"
Central heating return connection from DHW storage cylinder	Ø	3/4"
Gas connection	Ø	1/2"
<b>Flue systems</b>		
Horizontal-Concentric flue system	Ø mm	125/80
Max. Flue length	m	8
Twin pipe flue system	Ø mm	80/80
Max. Flue length (from terminal to terminal)	m	50
Twin pipe flue system	Ø mm	60/60
Max. Flue length (from terminal to terminal)	m	30
Vertical-Concentric flue system	Ø mm	125/80
Max. Flue length	m	8
<b>Gas Supply</b>		
Natural gas G 20		
Inlet pressure	mbar	20
Gas consumption	m <sup>3</sup> /h	3.6
Butane G30		
Inlet pressure	mbar	30
Gas consumption	kg/h	2.68
Propane G31		
Inlet pressure	mbar	37
Gas consumption	kg/h	2.64
<b>Electrical specifications</b>		
Power supply	V/Hz	230/50
Electrical power consumption	W	138
Electrical protection	IP	X4D



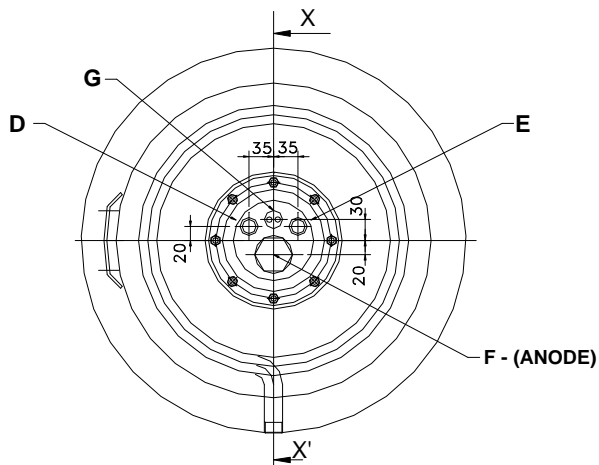
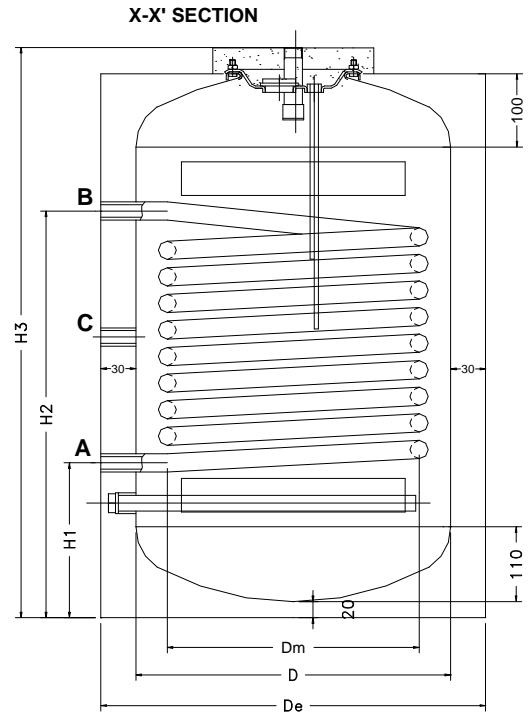
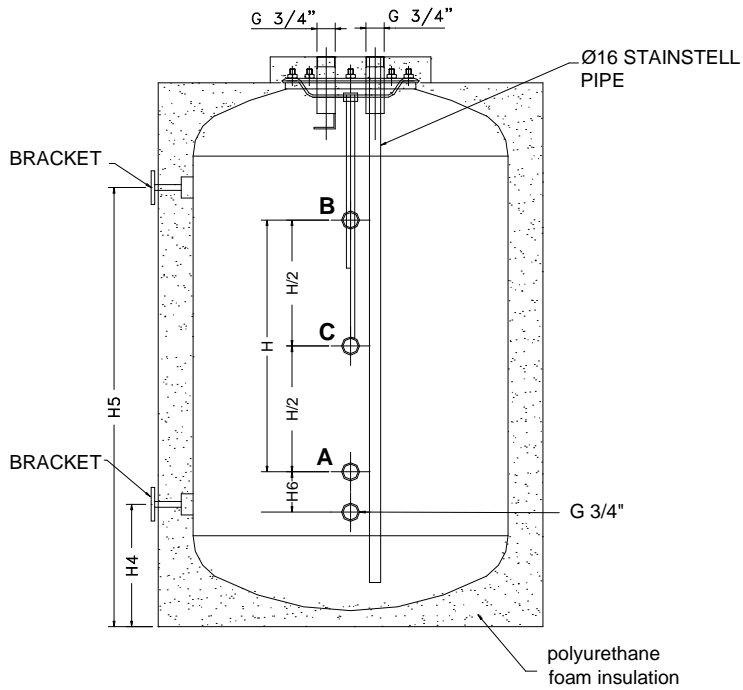
## 2.2 Dimensions



### LEGEND

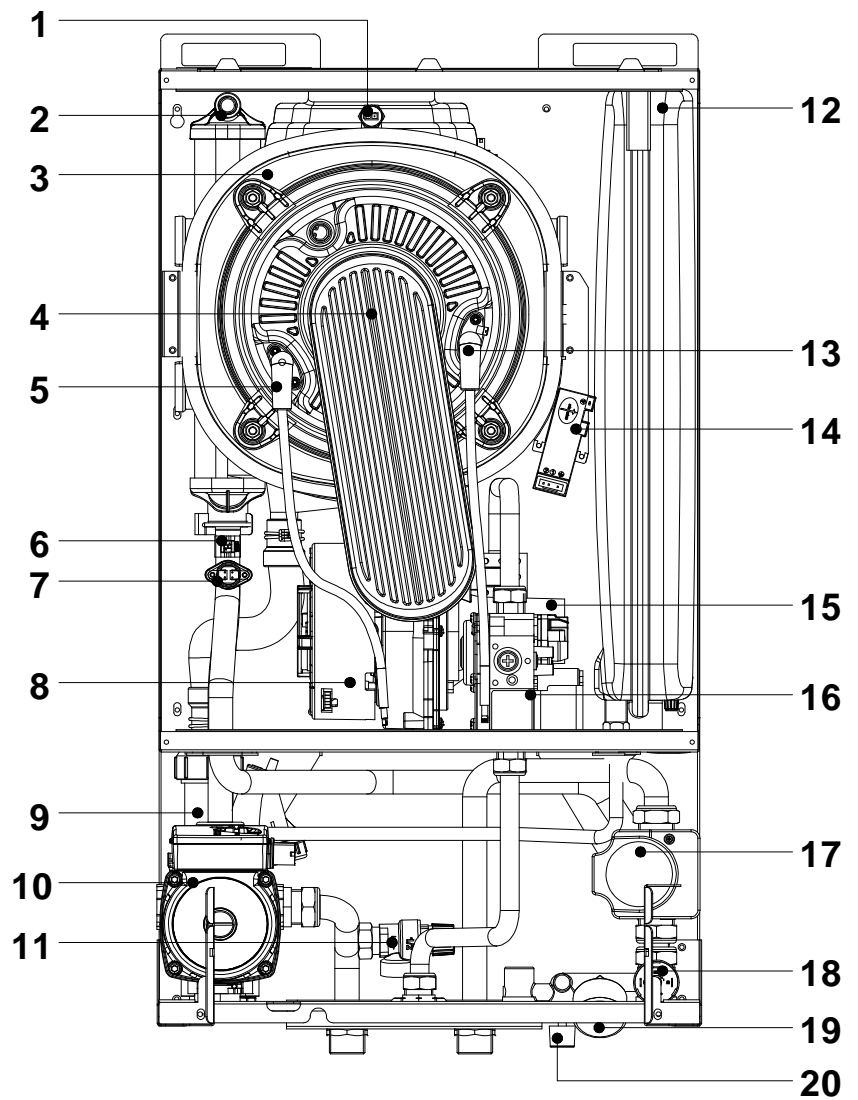
HR	HEATING RETURN	Ø3/4"
HF	HEATING FLOW	Ø3/4"
RCR	REMOTE D.H.W. CYLINDER RETURN	Ø3/4"
RCF	REMOTE D.H.W. CYLINDER FLOW	Ø3/4"
G	GAS	Ø1/2"
SC	CONDENSATE DRAIN	Ø25

## Storage tank 150 lt.



MODEL	U.M	150
Storage cylinder capacity	Lt	150
Storage cylinder exchange area	m <sup>2</sup>	1
Circulation pump	lt/h	2860
Heat Input max	kW	53
Hot water flow rate Dt 30°	Lt/h	1149
External diameter (De)	mm	510
Internal diameter (Di)	mm	450
H	mm	440
H1	mm	334
H2	mm	774
H3	mm	1113
H4	mm	175
H5	mm	633
H6	mm	162
A	mm	Ø3/4"
B	mm	Ø3/4"
C	mm	Ø3/4"
D	mm	Ø1/2"
E	mm	Ø1/2"
Max. heating working pressure	bar	12
Max. Hot water working pressure	bar	6
Max. temperature	°C	99

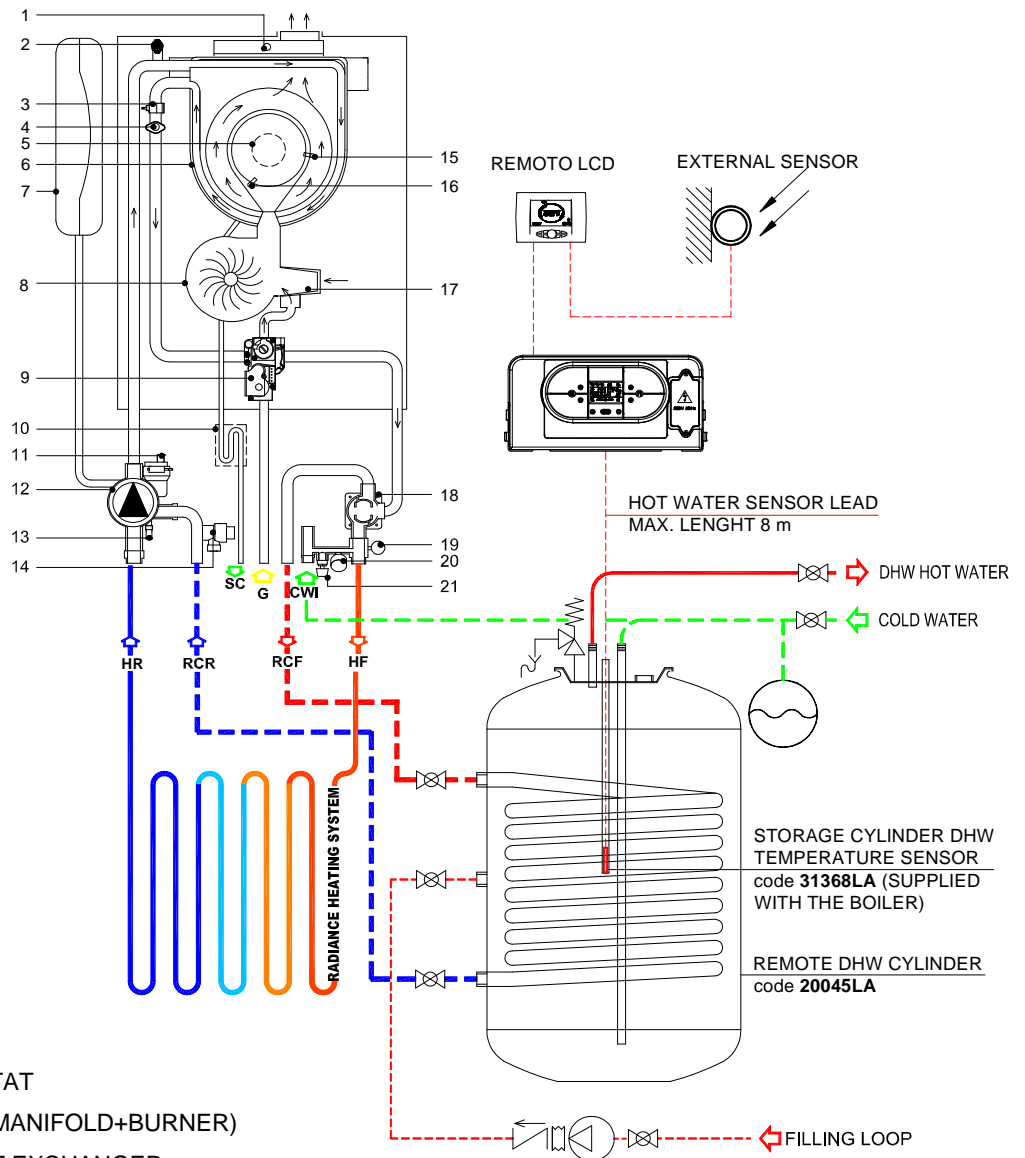
## 2.3 Internal parts of the boiler



### LEGEND

1. SAFETY THERMO FUSE
2. MANUAL AIR VENT VALVE
3. PRIMARY CONDENSING HEAT EXCHANGER
4. PREMIX BURNER UNIT (GAS MANIFOLD+BURNER)
5. IONISATION ELECTRODE
6. HEATING SAFETY THERMOSTAT
7. HEATING SENSOR
8. FAN
9. CONDENSATE TRAP
10. PUMP WITH AIR VENT
11. 3 BAR PRESSURE RELIEF VALVE - HTG CIRCUIT
12. EXPANSION VESSEL
13. IGNITION ELECTRODE
14. IGNITION TRANSFORMER
15. VENTURI
16. ELECTRONIC GAS VALVE
17. 3-WAY VALVE
18. WATER PRESSURE SWITCH
19. WATER PRESSURE GAUGE
20. FILLING TAP

## 2.4 Water circuit



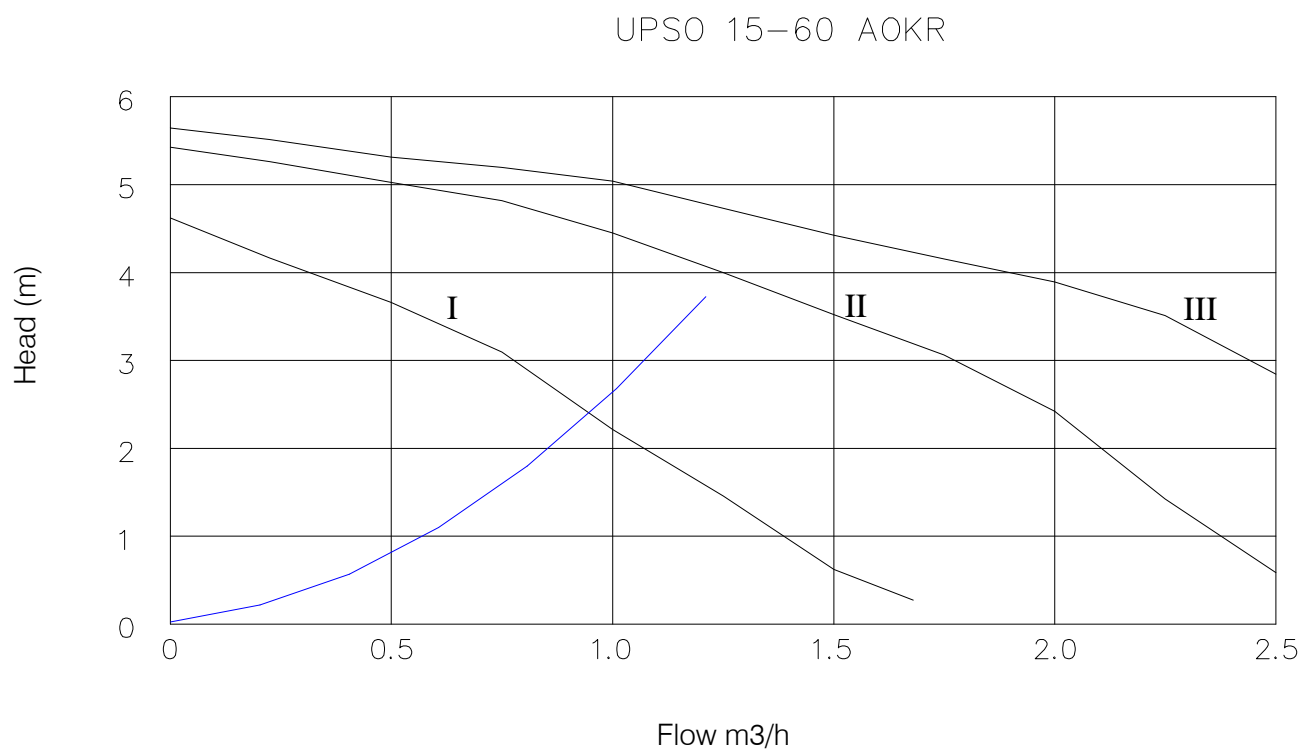
### LEGEND

1. SAFETY THERMO FUSE
2. MANUAL AIR VENT VALVE
3. HEATING SENSOR
4. HEATING SAFETY THERMOSTAT
5. PREMIX BURNER UNIT (GAS MANIFOLD+BURNER)
6. PRIMARY CONDENSING HEAT EXCHANGER
7. EXPANSION VESSEL
8. FAN
9. ELECTRONIC GAS VALVE
10. CONDENSATE TRAP
11. AUTOMATIC AIR VENT VALVE
12. PUMP
13. SYSTEM DRAIN VALVE
14. 3 BAR PRESSURE RELIEF VALVE - HTG CIRCUIT
15. IGNITION ELECTRODE
16. IONISATION ELECTRODE
17. VENTURI
18. 3-WAY VALVE
19. WATER PRESSURE SWITCH
20. WATER PRESSURE GAUGE
21. FILLING TAP

### LEGEND

HR	HEATING RETURN
HF	HEATING FLOW
RCR	REMOTE D.H.W. CYLINDER RETURN
RCF	REMOTE D.H.W. CYLINDER FLOW
G	GAS
SC	CONDENSATE DRAIN

## 2.5 Circulation pump head/flow graph



- III — Pump head at maximum speed
- II — Pump head at second speed
- I — Pump head at minimum speed
- Appliance Loss

## 2.6 DIGITECH® CS Printed Circuit Board (MIAH4)

### Technical characteristics

#### Adjustments for service personnel only



- Standard (30/80°C) / reduced (25-45°C) central heating temperature
- Water hammer prevention function
- Central Heating timer - (adjustable from 0 to 7,5 minutes)
- Central Heating pump overrun timer
- Domestic Hot Water pump overrun timer
- Minimum Gas pressure setting
- Maximum Heating Load
- Heating output rising time
- Central heating maximum and minimum Set Point adjustment
- Domestic Hot Water maximum Set Point Adjustment

#### User settings

- Heating Temperature setting (30-80°C) – (25-45°C)
- D.H.W. temperature setting (35-60°C)
- Summer only mode / Winter only mode / Summer + Winter mode selection

#### Operation/Functions display

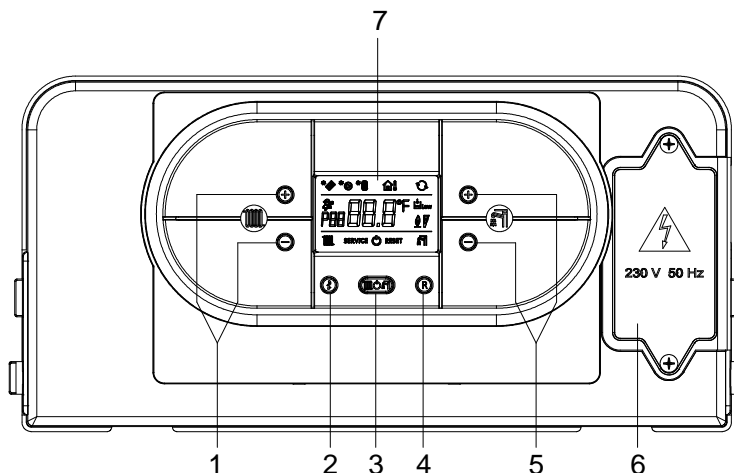
- Lock-Out
- Water low pressure
- Temperature display
- Flame presence ON (3 power steps)
- Error History display (last 5 errors)

- ➔ To switch the boiler OFF, press  INFO button, the symbol  appears on the display. The central heating frost protection system, the circulating pump inactivity protection and 3-way valve inactivity protection functions remain enabled.
- ➔ If the boiler was previously ON, it is switched OFF and the fan overrun and pump overrun functions are enabled.

## 2.7 Control panel

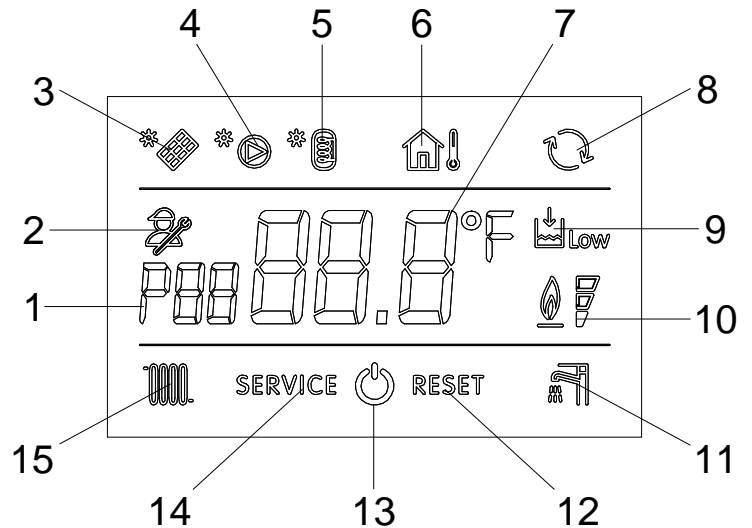
### Control panel Key

1. HEATING TEMPERATURE SETTING BUTTONS
2. INFO BUTTON: PRESS ONCE TO DISPLAY TEMPERATURES AND INFO (see 2.8 INFO menu display). KEEP INFO BUTTON PRESSED FOR 5 SECONDS (in OFF MODE) TO DISPLAY THE LAST 5 ERRORS.
3. MODE SELECTION BUTTON SUMMER ONLY / WINTER ONLY / SUMMER-WINTER / OFF.
4. RESET BUTTON: ERROR RESET – FLUE TEST FUNCTION ACTIVATION (CHIMNEY-SWEEPER - KEEP IT PRESSED FOR 7 SECONDS).
5. DOMESTIC HOT WATER TEMPERATURE SETTING BUTTONS. KEEP BUTTONS '+' AND '-' PRESSED FOR 5 SECONDS TO ACTIVATE THE DISPLAY BACKLIT MODE FOR A CONTINUOUS PERIOD OF 10 MINUTES.
6. TERMINAL BLOCK FOR EXTERNAL WIRING.
7. LCD DISPLAY.

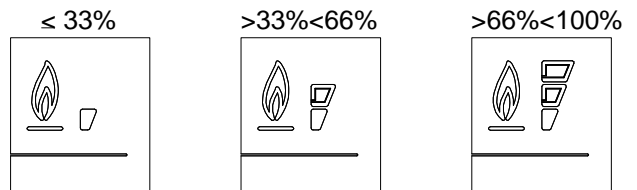


## LCD DISPLAY ICONS' KEY

1. PARAMETER NUMBER INFORMATION
2. PARAMETERS PROGRAMMING MODE ON
3. SOLAR PCB CONNECTION INFORMATION / SOLAR PANEL TEMPERATURE DISPLAY (d6)
4. SOLAR PUMP ON
5. STORAGE CYLINDER LOW LEVEL TEMPERATURE VISUALIZATION (d7) / STORAGE CYLINDER HIGH LEVEL TEMPERATURE VISUALIZATION (d8)
6. OUTDOOR TEMPERATURE SENSOR CONNECTED / OUTDOOR SENSOR TEMPERATURE DISPLAY (d2)
7. TEMPERATURE / SET POINT / PARAMETER VALUE INFORMATION
8. OPEN THERM COMPONENTS COMMUNICATION CONNECTED (REMOTE CONTROL / ZONE MANAGEMENT CONTROL BOX)
9. WATER LOW PRESSURE INFORMATION
10. (\*) FLAME PRESENCE ON (3 POWER STEPS)
11. D.H.W. MODE ENABLED
12. RESETTABLE ERROR DISPLAY
13. OFF MODE
14. NOT RESETTABLE ERROR DISPLAY
15. HEATING MODE ENABLED



**10 (\*) - During the boiler operation the display can show 3 different power levels according to the flame modulation of the boiler. (see flame icon/power % images)**



## 2.8 INFO Menu display

Press the 'INFO' Button to display the boiler data.

Once pressed, the parameter number will appear on the left side of the display and the associated parameter value will appear on the centre of the display. Use '↑' and '↓' buttons of Heating Temperature setting to scroll the list of available data.

Press the 'INFO' button to exit the display mode.

The list of available display data is the following:

Parameter	Icon	Description
d00		DHW sensor temperature
d01		Outdoor sensor temperature
d02		Kd Thermoregulation value
d03		Fan speed
d04		Low temperature circuit sensor (only with Zone PCB connected)
d05		Heating return sensor temperature
d06		Solar panel sensor temperature (only with Solar PCB connected)
d07		Solar storage cylinder temperature (low level) (only with Solar PCB connected)
d08		Solar storage cylinder temperature (high level) (only with Solar PCB connected)

### **3. *INSTALLATION* (authorised personnel)**

#### **3.1 Reference standard**

Failure to install a gas appliance correctly and in accordance with the above norms could lead to prosecution. It is in the interest of the installer and safety that the law is complied with.

The manufacturers instructions form an integral part of the installation and should be left with the appliance but do not over ride in anyway statutory obligations.

#### **3.2 Boiler room – Installation requirements**

Please refer to local and national standards in force in the Country of destination of the product. In particular the manufacturer recommends:

-  **The presence of threaded connections on the gas line, require that the room in which the appliance is installed is ventilated by means of air intakes.**



### 3.3 Unpacking

- The materials (cardboard) used for packing the appliance are fully recyclable.
- It is recommended that the packing material is only removed prior to installing the boiler. The manufacturer will not be held responsible for damage caused by incorrect storage of the product.
- Packing materials (plastic bags, polystyrene, nails, etc.) must not be left within reach of children, in that these items represent a potential hazard.

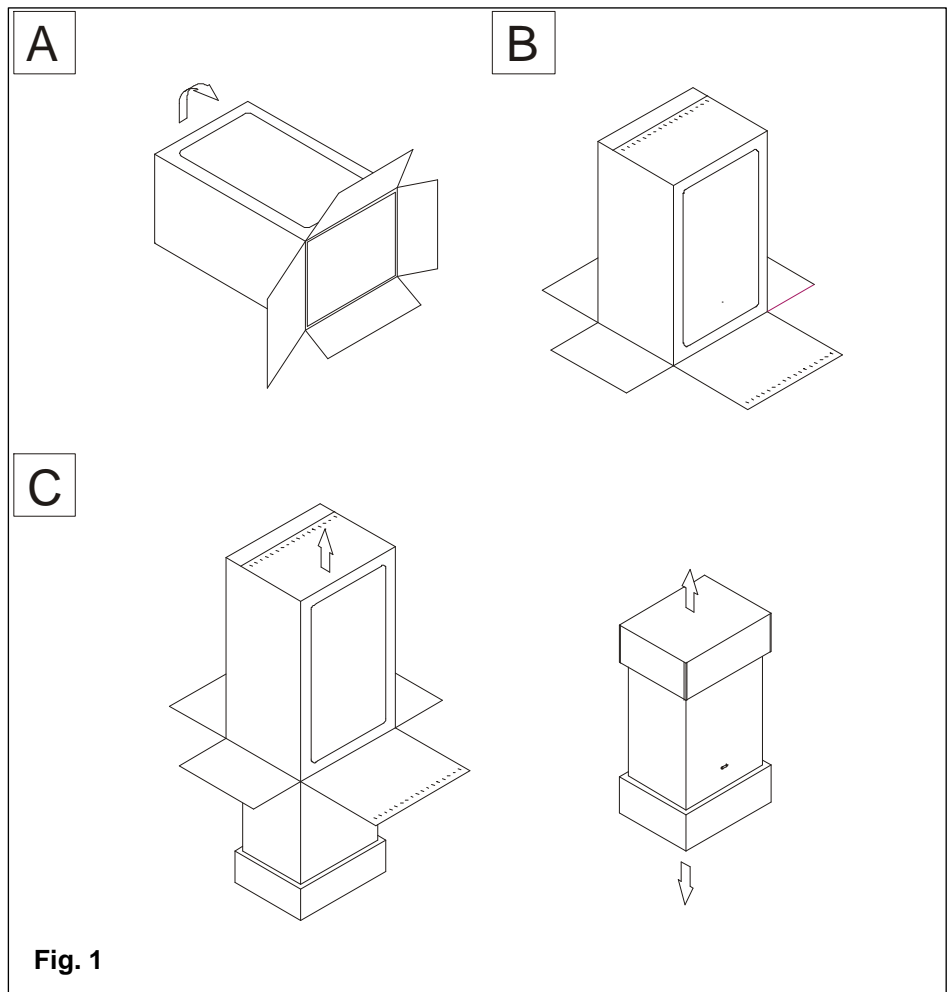
**A.** Place the packed appliance on the floor (see fig. 1) making sure that the "up" arrow is facing down. Remove the staples and open out the four flaps of the box.

**B.** Rotate the boiler 90° while manually supporting it from underneath

**C.** Lift the box and remove the protections. Lift the boiler by grasping the rear part and proceed with the installation.

#### STORAGE & HANDLING

Please note that prior to installation the Radiant boilers should be stored in the horizontal position with no more than three boilers to a stack; Ensure that the boilers are stored in dry conditions and be aware that the carton is a tow-man lift;



### 3.4 Installing the boiler

- The appliance must be installed exclusively on a flat vertical solid wall capable of supporting its weight.
- The boiler should be fitted within the building unless otherwise protected by a suitable enclosure i.e. garage or outhouse. (the boiler may be fitted inside a cupboard).
- If the boiler is sited in an unheated enclosure then it is recommended to leave the power on to give frost protection (frost protection is active even with on/off switch in off position).
- If the boiler is installed in a room containing a bath or shower reference must be made to the relevant requirements.

In order to allow access to the interior of the boiler for maintenance purposes, it is important that the necessary clearances indicated in figure 1 are respected. To make the installation easier, the boiler is supplied with a template to enable the pipe connections to be positioned prior to fixing the appliance to the wall.

To install the boiler, proceed as follows (see fig. 2):

- a. Use a spirit level (of not less than 25 mm long) to mark a horizontal line on the wall where the boiler is to be fitted.
- b. Position the top of the template along the line drawn with the level, respecting the distances indicated. Then mark the centres of the positions of the two wall-plugs or anchors. Finally, mark the positions of the water and gas pipes.
- c. Remove the template and install the domestic hot and cold water pipes, the gas supply pipe and the central heating pipes using the fittings supplied with the boiler.

Fix the boiler to the wall using the wall plugs or bracket and connect the pipes.

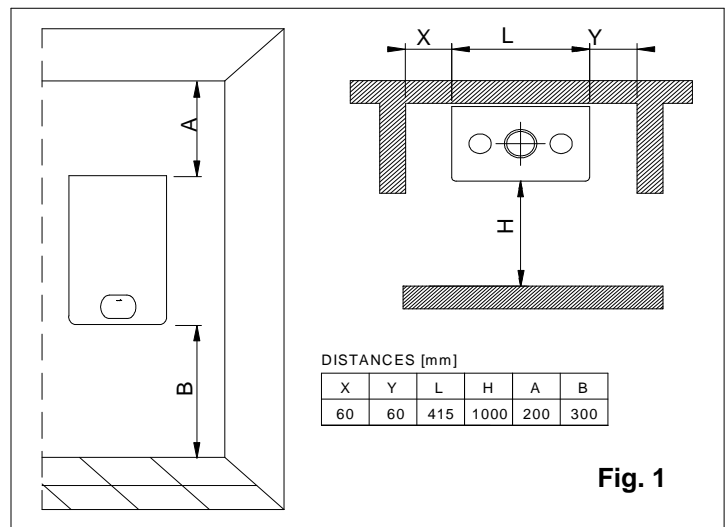


Fig. 1

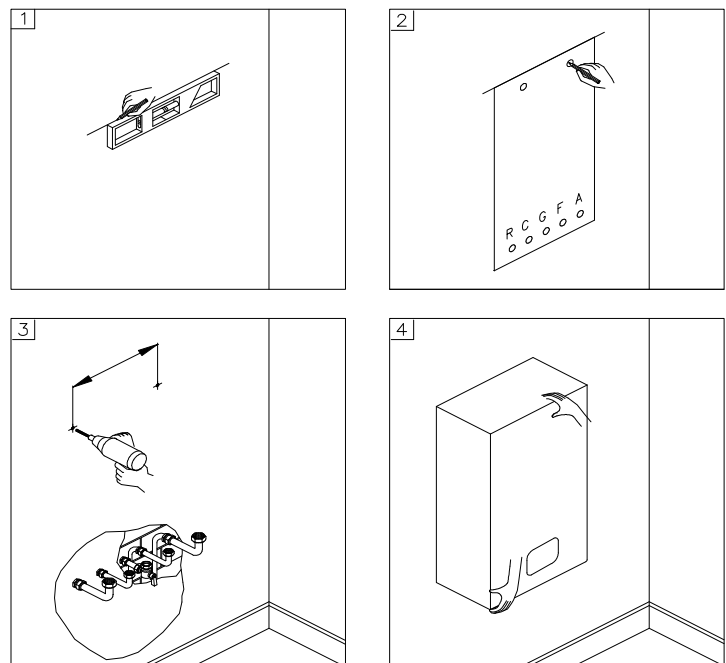


Fig. 2

### 3.5 Water connections

**⚠** In order to safeguard the heat exchanger and circulation pump, especially in case of boiler replacement, it is recommended that the system is hot-flushed to remove any impurities (especially oil and grease) from the pipes and radiators.

**⚠** Make sure that the domestic water and central heating pipes are not used to earth the electrical system. The pipes are totally unsuitable for this purpose.

**⚠** Isolation Valves must be installed on the heating and D.H.W circuits. This will facilitate all maintenance and service operations where the boiler needs to be drained.

- To prevent vibration and noise coming from
- the system, do not use pipes of reduced diameter, short radius elbows or severe reductions in the cross sections of the water passages.
- To facilitate the installation, the boiler is supplied with an hydraulic connection kit (see fig.2).

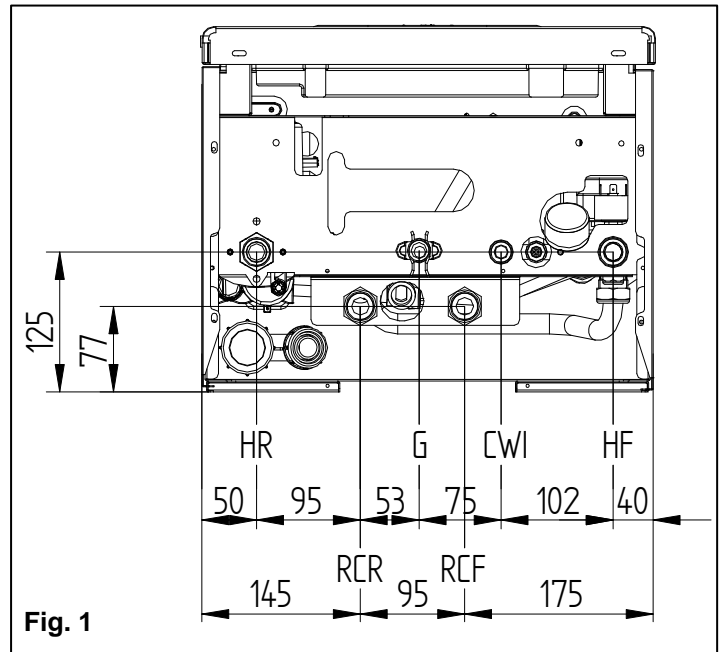


Fig. 1

#### Domestic hot water circuit

- In order to prevent scaling and eventual damage to the D.H.W heat exchanger, the mains water supply must not have a hardness rating of more than 17.5 °Ck. It is nevertheless advisable to check the properties of the water supply and install the appropriate treatment devices where necessary.

**The cold water supply pressure at the inlet to the boiler must be between 0.5 and 6 bar.**

**In areas with higher water inlet pressure a pressure reducing valve must be fitted before the boiler.**

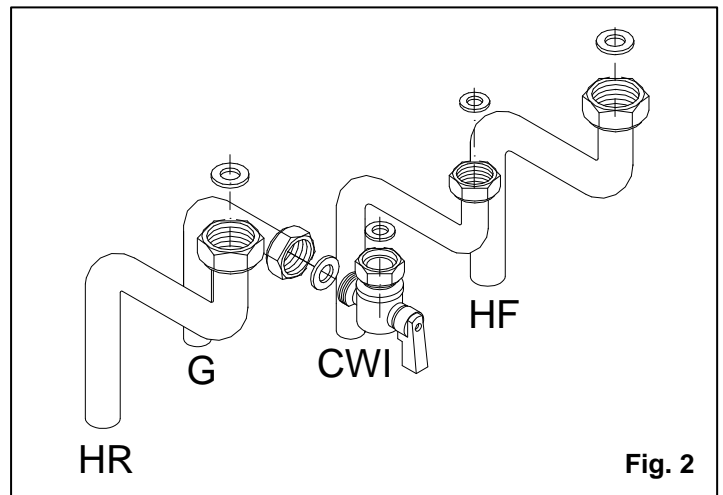


Fig. 2

The frequency of the heat exchanger coil cleaning depends on the hardness of the mains water supply and the presence of residual solids or impurities, which are often present in the case of a new installation. If the characteristics of the mains water supply are such that require it to be treated, then the appropriate treatment devices must be installed, while in the case of residues, an in-line filter should be sufficient.

All D.H.W. circuits, connections, fittings, etc. should be fully in accordance with relevant standards and water supply regulations.

#### Central heating circuit

In order to prevent scaling or deposits in the primary heat exchanger, the mains supply water to the heating circuit must be treated according to the requirements of local standards.

This treatment is indispensable in the case where the circuit is frequently topped-up or when the system is often either partially or fully drained.


The outlet connection of the boiler safety valve must be connected to a discharge trap. The manufacturer will not be held responsible for flooding caused by the operation of the safety valve in the case of system overpressure.


## Condensate Drain

The condensate drain flexible pipe supplied with the boiler (conforming to UNI EN 677 standard) must be connected to a proper condensate trap. The condensate discharge into the drainage system is allowed providing a condensate trap (siphon) is installed.

Any condensate discharge pipe work external to the building (or in an unheated part of it) must be insulated to protect against frost. Before switching the boiler On, check the correct condensate discharge.

## 3.6 Gas Connection

 **The connection to the gas supply must be carried out by professionally qualified personnel in accordance with relevant standards:**


 **When connecting the boiler to the gas supply pipe, only use appropriate washers and gas fittings. The use of hemp, Teflon tape and similar materials is not allowed.**


**Before installing the boiler, check the following:**

- The pipe work must have a section appropriate for the flow rates requested and the pipe lengths installed, and must be fitted with all the safety and control devices provided for by current standards.
- The gas supply line must be a minimum of a 22 mm diameter pipe with an uninterrupted supply from meter to boiler and comply with current standards and regulations.
- ***Check the internal and external seals of the gas supply system.***
- A gas shut-off valve must be installed upstream of the appliance
- The gas pipe work must have and bigger or equal section to the one of the boiler.
- Before starting up the boiler, make sure that the type of gas corresponds to that for which the appliance has been set-up (see gas type label inside the boiler).
- The gas supply pressure must be between the values reported on the rating plate (see gas type label inside the boiler).
- Prior to installation, it is good practice to ensure that there are no machining residues on the gas supply pipe.
- Conversion of the appliance from natural gas to LPG or vice versa must be carried out by qualified personnel ;

## 3.7 Electrical connections

### General warnings

 The connection to the mains power supply must be carried out by professionally qualified personnel, registered in accordance with current legislation and authorised by Radiant Bruciatori S.p.a.

 Always check to make sure that the appliance has an efficient earth system. This requirement is only satisfied if it has been properly connected to an efficient earth system installed in accordance with the requirements of current safety standards and carried out by professionally qualified personnel.

This basic safety measure must be checked, verified and carried out by professionally qualified personnel.

In case of doubt, have the electrical system checked by a qualified electrician. The manufacturer will not be held liable for any damage or injury caused as a result of an inefficient or inexistent earth system;

- The boiler functions with an alternating current of 230 V and 50 Hz and has maximum power absorption of 180 W. **The appliance should be protected by a 3 A fuse.** The connection to the mains electricity supply must be via a single-pole switch, with at least 3 millimetres gap between open contacts, mounted upstream of the appliance. Make sure that the positions of the live and neutral wires correspond to the wiring diagram;
- Ensure the domestic power supply is checked by a qualified electrician to ensure that it can support the maximum power absorption of the appliance, as indicated on the rating plate. In particular, make sure that the cable sizes are adequate for the power absorbed by the appliance;
- The power supply cable must not be replaced by the user. If the cable is damaged in any way, switch off the appliance and have the cable replaced by a suitably qualified electrician;
- When replacing the power supply cable, only use cables of the same characteristics (HO5 VV-F 3x1) with maximum external Ø 8 mm;

**When using an electrical appliance, a few fundamental rules must be observed:**

- Do not touch the appliance with damp or wet parts of the body or when barefoot.
- Do not pull on the electric wires.
- Do not leave the appliance exposed to atmospheric elements (rain, sun, etc.) unless these conditions have been expressly provided for.
- Do not allow the appliance to be used by children or anyone unfamiliar with its operation;

## Remote control connection

**Connect the power supply to the terminal board inside the control panel as follows:**

- a. Switch off the power supply at the main switch.
- b. Remove the front case panel of the boiler.
- c. Slacken the screws and remove plate A (see fig. 1).
- d. With the plate removed, connect the wires to the terminal board B as follows:
  - Connect the earth wire (normally coloured green/yellow) to the terminal marked with the earth symbol “ $\perp$ ”.
  - Connect the neutral wire (normally coloured blue) to the terminal marked with the letter “N”.
  - Connect the live wire (normally coloured brown) to the terminal marked with the letter “L”.
  - Terminals identified by the letters: Ta  $\Rightarrow$  Room thermostat  
Se  $\Rightarrow$  Outside temperature sensor

When the wires have been connected, place plate “A” back to position.

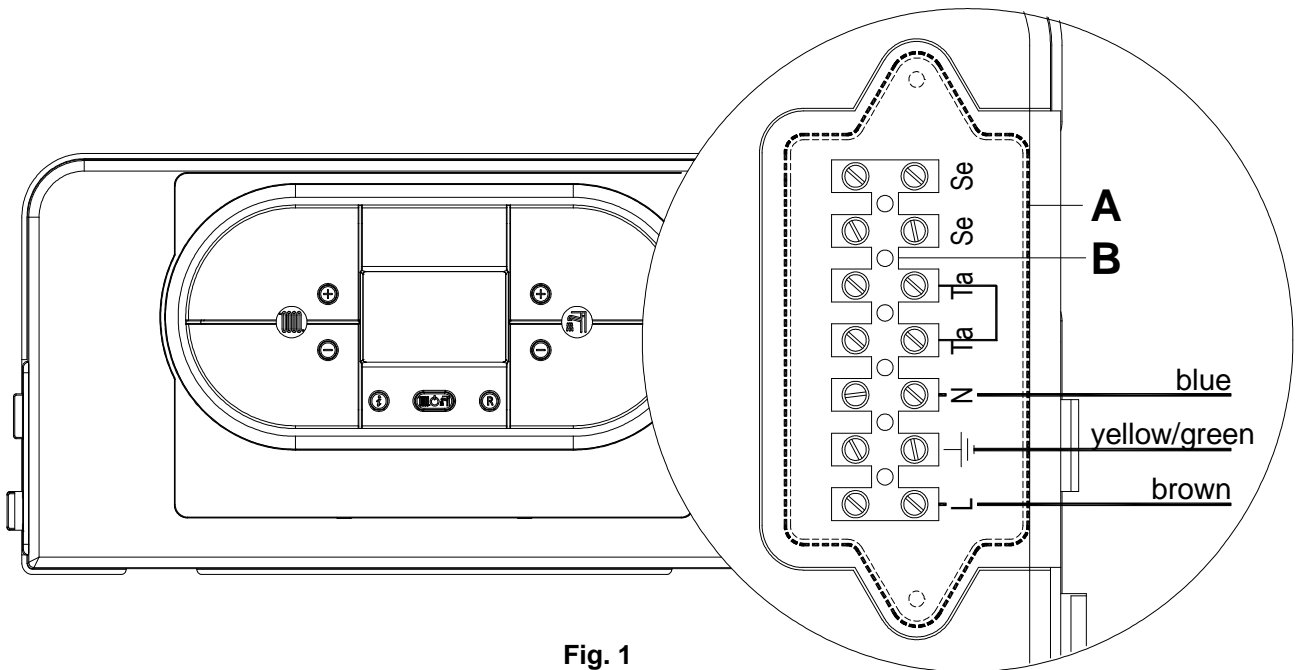


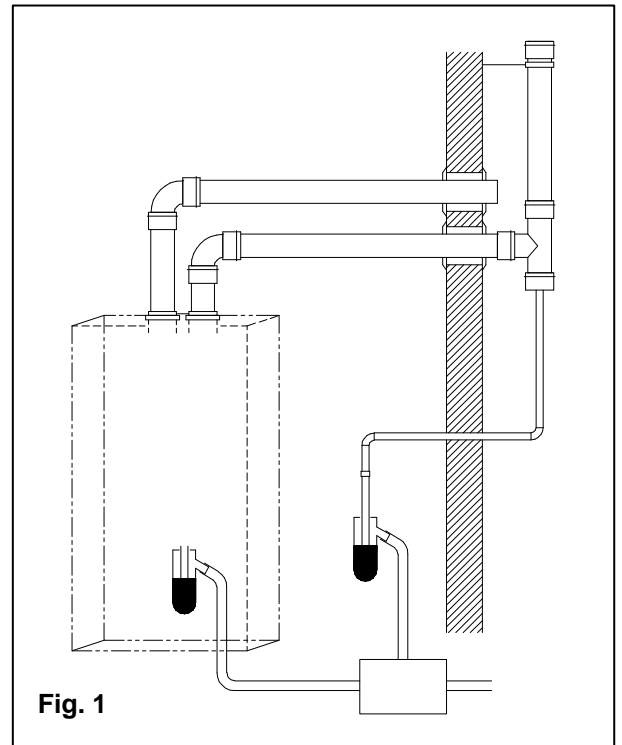
Fig. 1

## 3.8 Flue connections

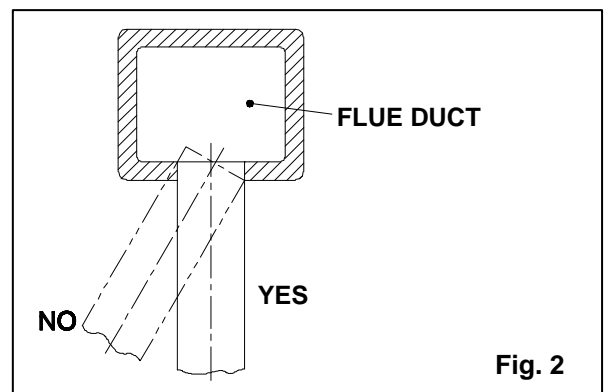
**⚠ In order to ensure that the appliance functions correctly and efficiently, the flue connection between the boiler and the flue terminal must be made using original components specifically designed for condensing boilers.**

**⚠ Traditional flue components cannot be used for conveying exhaust fumes from condensing boilers, nor vice versa.**

- In order to make the choice of which flue to install easier, in addition to being drawn differently, the above-mentioned system is also differentiated in the flue catalogue and general price list by the insertion of the words "...in polypropylene..." .
- It is recommended that:
  - o for the exhaust discharge duct, the entire length of the flue slopes upwards towards the exterior in order to facilitate the flow of condensate back to the combustion chamber, which has been specifically designed to collect and drain the acidic condensate;
  - o for the air intake, the entire length of the duct slopes upwards towards the boiler to prevent the entry of rainwater, dust or foreign bodies into the pipe;
  - o in case of a vertical flue pipe installation, a condensate trap is fitted at the base of the flue installation and connected into drainage system (see fig. 1);
- In the case where a horizontal coaxial system is installed, the coaxial terminal must be positioned horizontally in that the exhaust duct has been specifically designed with the required slope and the air intake has been suitably protected against the weather;



**Fig. 1**



**Fig. 2**

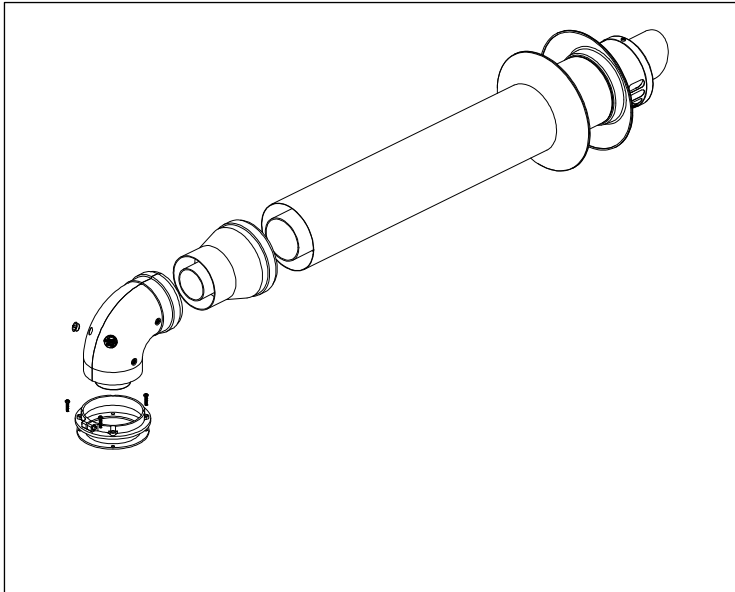
### Flue Duct connection

Connect the flue to the chimney according to the following specification:

- Do not allow the exhaust flue to protrude inside the chimney; instead terminate it before it reaches the flue duct;
- The exhaust flue must be perpendicular to the opposite wall of the flue duct (see fig. 2).

## Flue type - kit AK50

**Horizontal concentric flue kit Ø80/125 mm polypropylene inner pipe adjustable through 360°.**  
Discharges exhaust fumes and draws air from atmosphere.



**Suitable for condensing boilers only. Discharges exhaust gases and draws combustion air by means of two concentric ducts. The external Ø125 duct draws the combustion air while the Ø80 plastic inner duct discharges the exhaust fumes.**

The discharge duct can be connected directly to the outside or can be connected to a suitable combined flue system.

**MAXIMUM FLUE LENGTH: 8 m**

**The *maximum* flue length (linear equivalent) is obtained by summing the length of linear pipe and the equivalent lengths of each bend fitted.**

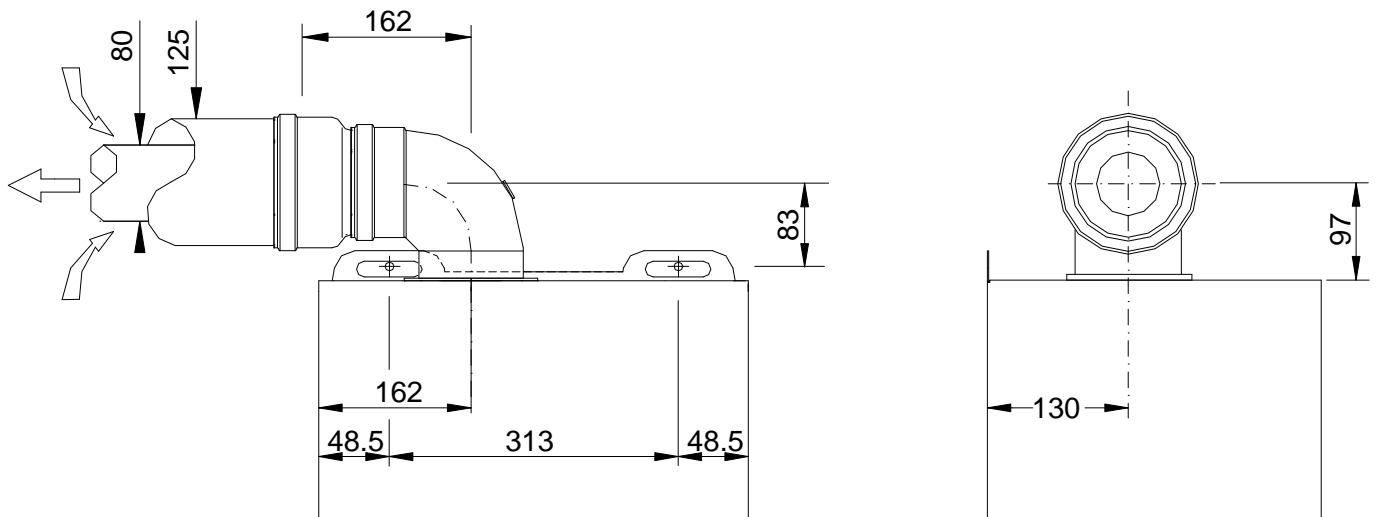
The *linear equivalent* is intended as being the total length of the duct from the connection with the combustion chamber of the appliance, excluding the first bend.

**The *linear equivalent* of additional bends is as follows:**

Ø 80/125 x 90° bend = 0.8 m.

Ø 80/125 x 45° bend = 0.5 m.

**N.B.: USE ONLY RADIANT TYPE-APPROVED FLUE SYSTEMS FOR DISCHARGING EXHAUST GASES AND DRAWING COMBUSTION AIR.**

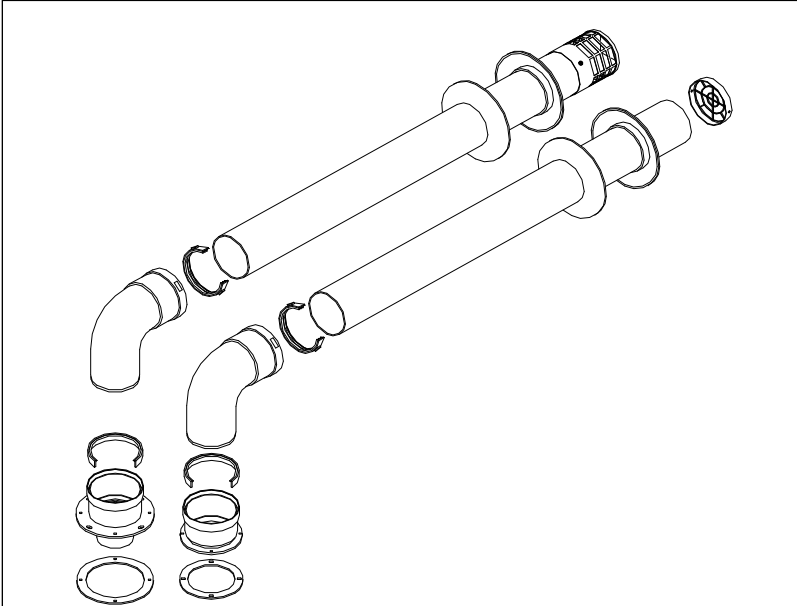




## Flue type - kit H

### Horizontal twin pipe flue kit Ø80/80 – Ø60/60 in polypropylene adjustable through 360°.

The dual pipe system discharges exhaust fumes into a chimney and draws air from atmosphere.



**Suitable for condensing boilers only.** Discharges exhaust gases and draws combustion air through two separate Ø 80 ducts.

**MAXIMUM FLUE LENGTH:**

**Ø80/80: 50 m.**

**Ø60/60: 30 m.**

The *maximum* flue length (linear equivalent) is obtained by summing the length of linear pipe and the equivalent lengths of each bend fitted.

The *linear equivalent* is intended as being the total length of the duct (exhaust discharge + air intake) from the connection with the combustion chamber of the appliance, excluding the first bend.

**The addition of a bend has the effect of increasing the linear equivalent length of the duct as follows:**

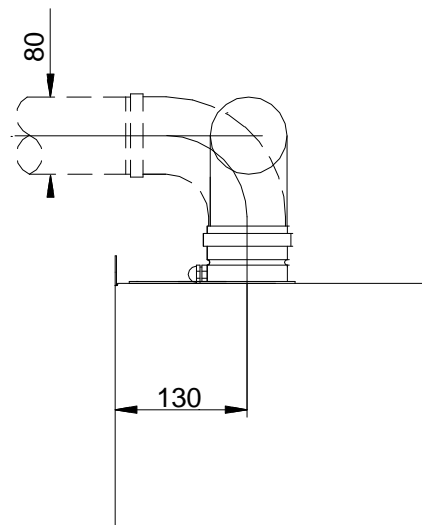
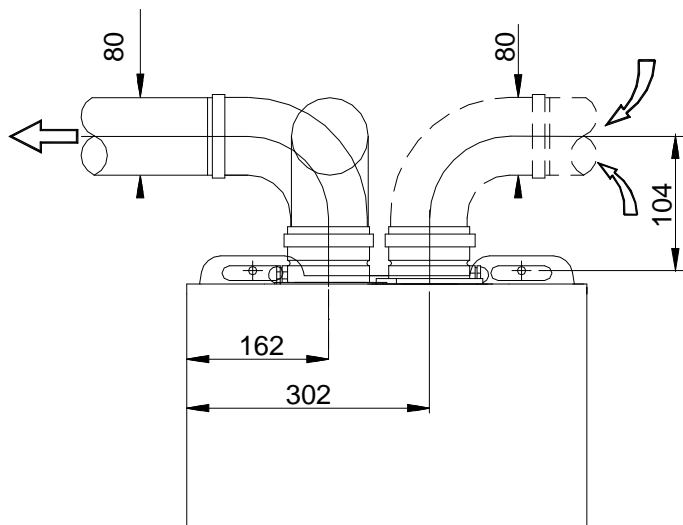
Ø80 x 90° bend = 1.5 m.

Ø80 x 45° bend = 1.2 m.

Ø60 x 90° bend = 1.8 m.

Ø60 x 45° bend = 1.5 m.

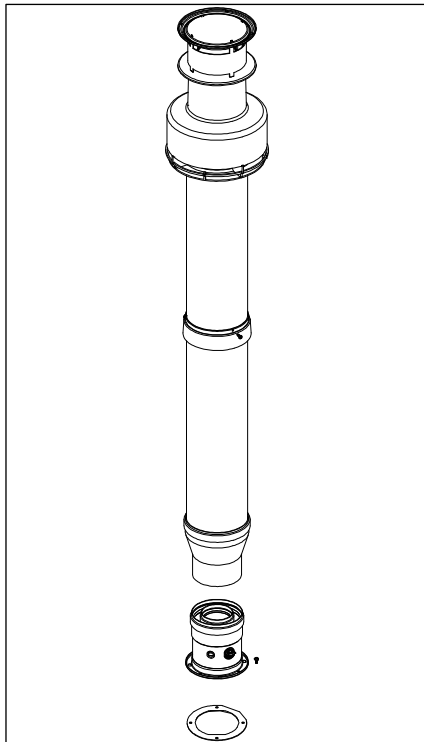
**N.B.: USE ONLY RADIANT TYPE-APPROVED FLUE SYSTEMS FOR DISCHARGING EXHAUST GASES AND DRAWING COMBUSTION AIR.**



## Flue type - kit CK50

### Vertical concentric flue kit Ø80/125 polypropylene inner pipe.

Discharges exhaust fumes and draws air directly from high Level.



#### **Suitable for condensing boilers only.**

Discharges exhaust gases and draws combustion air at roof level by means of two concentric ducts. The external Ø125 duct draws the combustion air while the Ø80 plastic inner duct discharges the exhaust fumes.

#### **MAXIMUM FLUE LENGTH: 8 m**

The *maximum* flue length (linear equivalent) is obtained by summing the length of linear pipe and the equivalent lengths of each bend fitted.

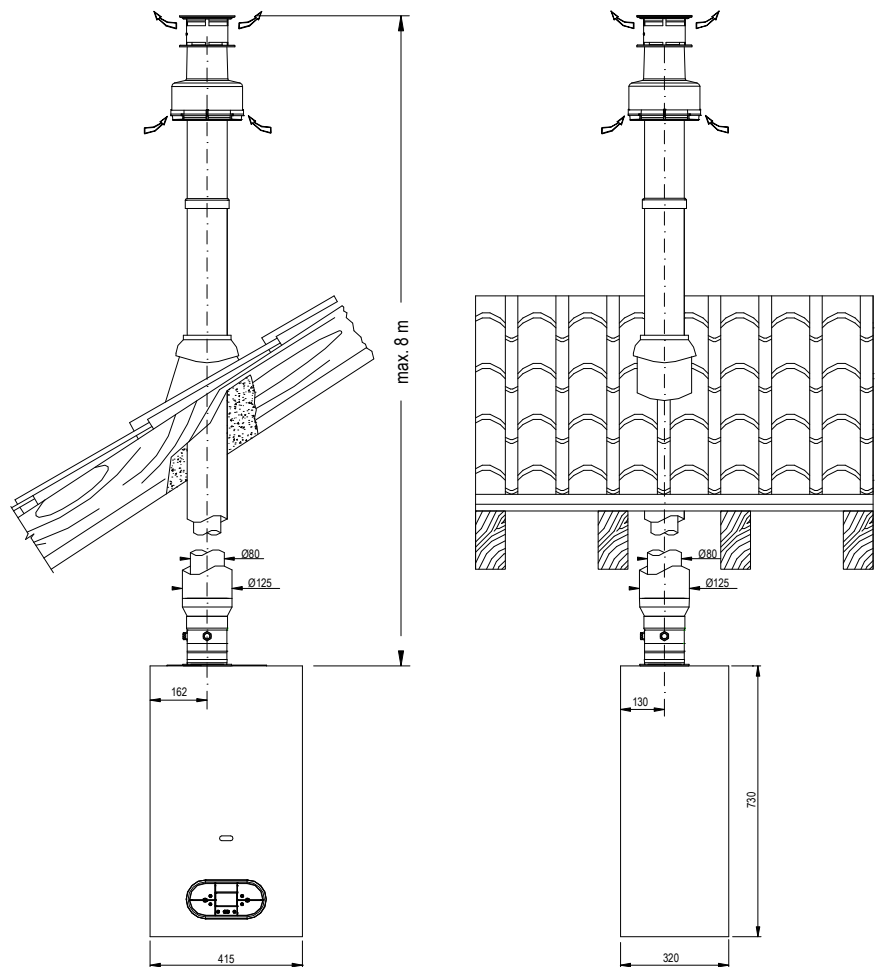
The *linear equivalent* is intended as being the total length of the duct from the connection with the combustion chamber of the appliance, excluding the first bend.

#### **The linear equivalent of additional bends is as follows:**

$$\text{Ø80/125} \times 90^\circ = 0.8 \text{ m.}$$




$$\text{Ø80/125} \times 45^\circ = 0.5 \text{ m.}$$

**N.B.:** USE ONLY RADIANT TYPE-APPROVED FLUE SYSTEMS FOR DISCHARGING EXHAUST GASES AND DRAWING COMBUSTION AIR.



## 4. COMMISSIONING THE APPLIANCE

### 4.1 General warnings

-  **The following operations must be carried out by professionally qualified personnel, registered in accordance with current legislation.**
-  **The boiler leaves the factory pre-set and tested for burning either natural Gas or LPG. Nevertheless, when starting the boiler for the first time, make sure that the information on the rating plate corresponds to the type of gas being supplied to the boiler.**
-  **Once the system has been filled and the necessary adjustments made, remember to tighten the screws of the gas valve test point and make sure that there are no gas leaks from the test point and from any pipe fittings upstream of the gas valve.**

### Preliminary operations

Switching the boiler on for the first time means checking that the installation, regulation and operation of the appliance are correct :

- If the gas supply system is newly installed, then the air present in the pipes can cause the boiler not to light at the first attempt. A number of attempts may be required in order to light the boiler;
- Check that the data on the data plate corresponds to that of the mains supply networks (gas, electricity, water);
- Check that the power supply voltage to the boiler complies with the data plate (230 V – 50 Hz) and that the live, neutral and earth wires are connected properly. Also make sure that the earth connection is sound;
- Check the seals on the gas supply pipe from the mains, and make sure that the meter does not register any flow of gas;
- Turn the gas supply on and purge.
- Test for gas soundness.
- Check that the gas supply is correctly sized for the flow rate required by the boiler and that it is fitted with all the safety and control devices as lay down by current regulations
- Check that the supply of combustion air and exhaust and condensate discharge systems are functioning correctly and in line with current law and national and local standards;
- Check for the presence of permanent aeration/ventilation openings as required by current law for the type of appliances installed.
- Check that the flue duct and its connections to the terminal/chimney comply with the requirements of current law and national and local standards for the type of appliances installed.
- Make sure that any central heating shut-off valves are open.
- Check that the condensate drain system, including outside the boiler (flue system condensate collection devices), allows the condensate to flow freely to the collection devices. If the condensate is discharged to the domestic drainage system, install an inspection trap in the condensate system prior to it entering the drainage system to interrupt the continuity between the two systems.
- Check that there are no exhaust fumes discharged into the system itself.
- Check that there are no flammable materials or liquids in the immediate vicinity of the boiler;

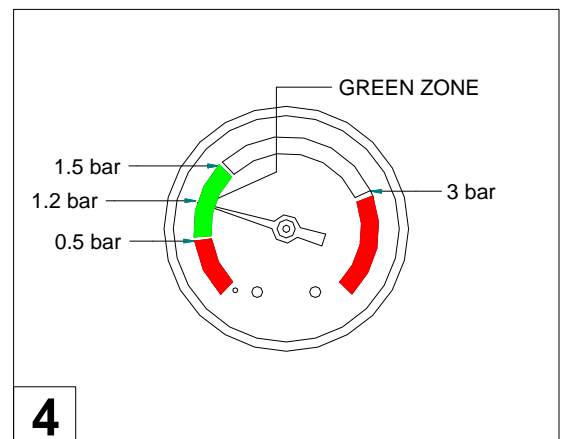
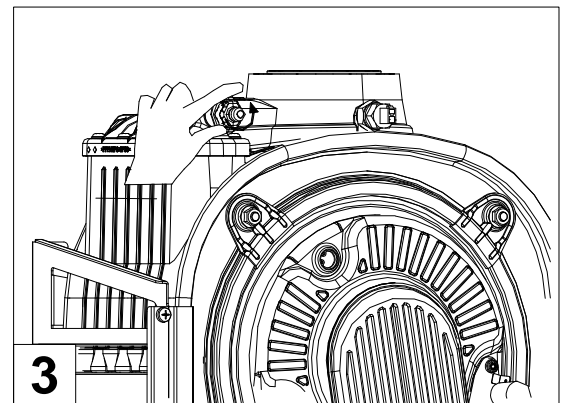
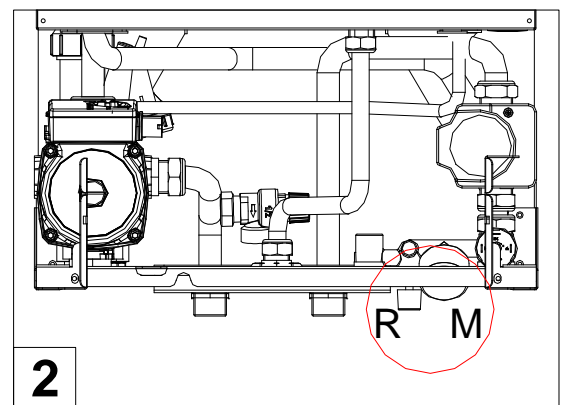
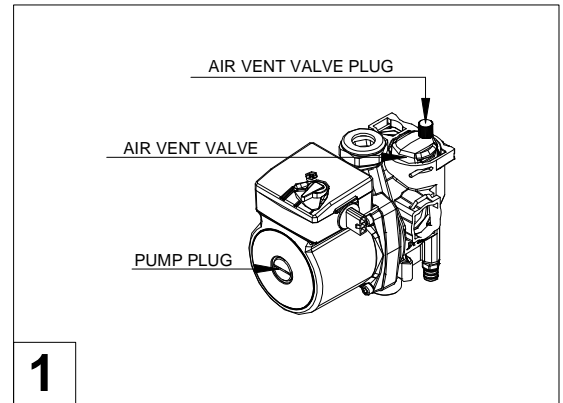
## 4.2 Filling the system

**⚠** Check the properties of the water supply and install the appropriate treatment devices if the mains water has a hardness rating more than 25 °f, in order to prevent scaling and eventual damage to the D.H.W heat exchanger.

**⚠** Use only clean tap water to fill the system.  
If antifreeze chemical agents are used to fill the system, install a hydraulic compensator on the filling system in order to separate the heating circuit from the D.H.W circuit.

**Before switching the power supply ON, fill the system as follows:**

- Check that the circulating pump runs freely;
- Check that the plug of the air vent valve has been slackened slightly to allow air to escape from the system (fig. 1);
- **Connect a rubber pipe to the draining tap placed on top of the condensing heat exchanger (fig. 3) and turn it counter-clockwise.**
- open the filling tap **R** (fig. 2);
- to direct any air away from the system;
- close the draining tap placed on top of the condensing heat exchanger (fig. 3);
- use a pressure gauge **M** (fig. 2) to check that the system pressure reaches the middle part of the green zone corresponding to 1.2 bar (fig. 4).
- **On completion, make sure that the filling tap R is perfectly closed R (fig. 2).**
- Unscrew the plug on the pump to remove any trapped air, check that the pump is free then re-tighten it when water starts to flow out (fig.1);
- Open the air vents on the radiators and monitor the air evacuation process. When water starts to flow out of the radiators, close the air vents.
- If, after the above operations, there is a pressure reduction, re-open the filling tap **R** until the pressure gauge reaches the middle part of the green zone corresponding to 1.2 bar (fig. 4).



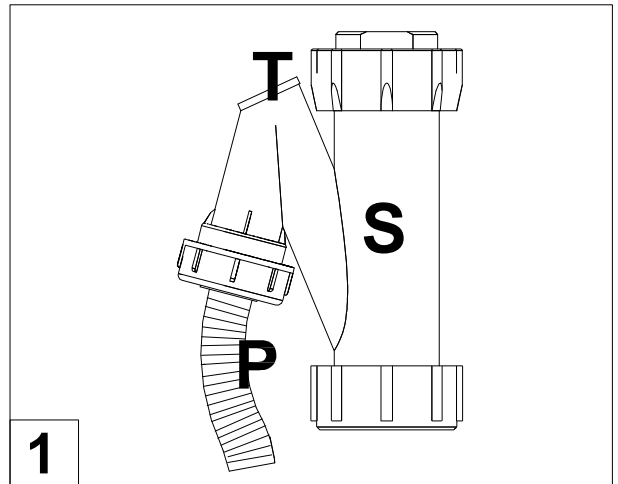
### 4.3 Filling the condensate trap

The condensation trap must be pre-filled when starting the boiler for the first time in order to prevent flue gases from flowing back through the trap.

The filling operation is carried out as follows (see fig. 1):

- Remove plug **T** and fill the trap **S** three quarters full with water;
- Replace plug **T** and connect the drainpipe **P** into a condensate discharge trap conforming to current legislation;

**Attention!** It is recommended to clean the condensate trap, after a few months of boiler operation, to remove deposits/residuals left after the first condensate passage within the boiler new components that may interfere with the correct operation of the trap itself.



## 4.4 Frost Protection

The boiler is protected from freezing by electronic board settings and special functions that provide the starting of the burner to heat all the interested parts, when their temperature drops below the minimum preset values, protecting the boiler up to an external temperature of -10°C.

The device operates as follows:

- The heating circuit water temperature drops below 5 °C, the burner is automatically switched ON until the water reaches a temperature of 30°C.
- The domestic hot water temperature drops below 4°, the burner is automatically switched ON until the water reaches a temperature of 8°C.

**⚠ The system operates even if the boiler is in OFF mode, as long as it is electrically powered (230 V) and the gas supply is open.**

**⚠ In case of long periods of inactivity, it is recommended to empty the boiler and the hydraulic system.**

### Warning for the service technician

In case of a boiler locked out because of freezing, before putting it into operation, make sure that any part is blocked by ice (heat exchanger, pump, etc.).

### Warning for the installer

In case of an outdoor boiler installation, where temperatures can drop below -10°C, it is recommended to fill the hydraulic system with an antifreeze inhibitor (see below Table for the dilution percentage) and to install a Heating elements kit (cod. **65-00200**).

<b>Table</b>		
<b>Antifreeze</b>	<b>Temperature</b>	
Ethylene glycol (%) volume	freezing point (°C)	boiling point (°C)
10	- 4	101
20	- 10	102
30	- 17	104
40	- 27	106
50	- 40	109
60	- 47	114
Recommended Glycol 20% percentage for temperatures up to -10°C.		

## 4.5 Starting up the boiler

Once the system has been filled, proceed as follows:



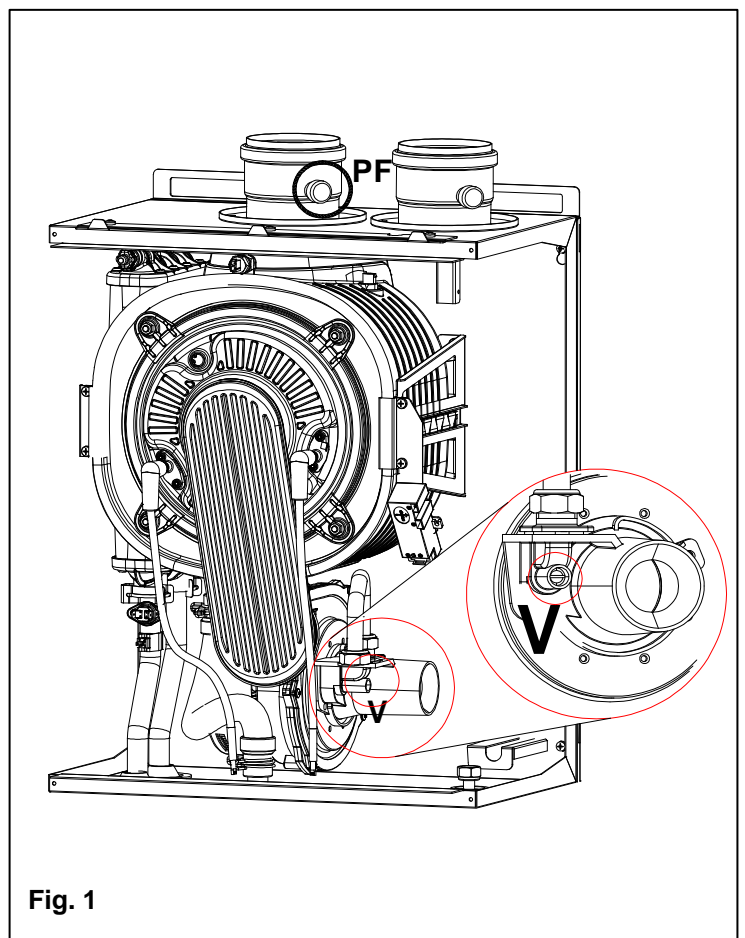
- Check that the exhaust duct is free from obstructions and correctly connected to the flue exhaust system;
- connect a rubber pipe to the draining tap placed on top of the condensing heat exchanger and turn it counter-clockwise;
- switch on the power supply to the boiler;
- **only for the first start-up, the ignition system will automatically start the 'System purging' function. The function code **F33** will appear on the display.**
- When the function is active, the pump circulates but the burner will not start for 5 minutes.
- to direct any air away from the system;
- The starting of the boiler is enabled only once the purging cycle has been completed.
- close the draining tap placed on top of the condensing heat exchanger;
- Open the gas feed valve;
- Use button  to select the WINTER mode.  
The symbol  will light up (fixed light) to indicate the selected operation mode.
- The automatic ignition system will then light the burner.
- In case of flame failure, the ignition system repeats the ignition procedure after the fan-overrun cycle (20 sec). It may be necessary to repeat the operation in order to remove all the air from the pipes. To repeat the operation, wait approximately 5 seconds from the last ignition attempt before resetting the error code **E01** (pressing the reset button 'Ⓜ').

Table n°1

Gas type	CO <sub>2</sub> %
G 20	9.18
G 30	10.3
G 31	10.3



## 4.6 CO<sub>2</sub> Value adjustment

- Unscrew the aluminium plug and insert the gas analyser in the exhaust test point **PF** (fig. 1) to check the CO<sub>2</sub> value. Make sure that the value complies with that stated in Table n° 1;
- If the CO<sub>2</sub> value does not correspond to that stated, adjust screw **V** (see fig. 1) on the venturi manifold clockwise to reduce the CO<sub>2</sub> value or counter-clockwise to increase it. Use a 4mm Allen Wrench for this adjustment.

## 5. REGULATING THE BOILER

### 5.1 Parameters table

PARAMETER N°	TYPE OF OPERATION	PARAMETER VALUE	FUNCTION
P00	Selects the model of boiler	00-06	00 = 13 kW 01 = 18 kW 02 = 25 kW 03 = 28 kW 04 = 34 kW 05 = 50 kW 06 = 100 kW
P01	Selects the type of boiler	00-05	00 = Istantaneous boiler (w/dual circuit exchanger) 01 = Istantaneous boiler (w/secodary d.h.w plate exch.) 02 = Storage cylinder boiler 03 = Boiler wit Comfort storage cylinder 04 = Comfort istantaneous boiler (w/sec. d.h.w plate exch.) 05 = Only heating boiler
P02	Selects the type of gas supply	00 01 02	Natural gas LPG G25
P03	Sets the central heating temperature	00 01	Standard (30-80 °C) Reduced (25-45 °C)
P04	Heating output rising time	00-04	00 = 0 seconds (Disabled) 01 = 50 seconds (Default) 02 = 100 seconds 03 = 200 seconds 04 = 400 seconds
P05	Water hammer prevention function	00 01	Off On
P06	D.H.W priority function	00 01	Off On
P07	Central heating timer	00 - 90	Displayed in multiples of 5 seconds (default value 36 x 5 = 180")
P08	Central heating pump overrun timer	00 - 90	Displayed in multiples of 5 seconds (default value 36 x 5 = 180")
P09	D.H.W/Storage cylinder pump overrun timer	00 - 90	Displayed in multiples of 5 seconds (default value 18 x 5 = 90")
P10	Sets the minimum fan speed	33 - P11	Displayed in hertz (1Hz = 30 rpm)
P11	Sets the maximum fan speed	P10 - 203	Displayed in hertz (1Hz = 30 rpm)
P12	Sets the minimum fan speed (central heating)	33 - P13	Displayed in hertz (1Hz = 30 rpm)
P13	Sets the maximum fan speed (central heating)	P12 - 203	Displayed in hertz (1Hz = 30 rpm)
P14	Sets the ignition sequence	33 - 203	Displayed in hertz (1Hz = 30 rpm)
P15	Legionella prevention function (for storage boilers only)	00 01	Off On
P16	Sets the climatic compensation curve (w/outdoor temperature sensor only installation)	00-30	See the graph in the parameter setting explanation
P17	Sets the temperature measurement unit	00 01	°C °F



PARAMETER N°	TYPE OF OPERATION	PARAMETER VALUE	FUNCTION
P18	Sets the 0-10V industrial bus piloting	00-02	00 = Disabled 01 = Flow temperature control mode 02 = Burner output control mode
P19	Central heating minimum set point	20 - 40	Displayed in °C
P20	Central heating maximum set point	40 - 90	Displayed in °C
P21	D.H.W maximum set point	45 - 75	Displayed in °C
P22	$\Delta T$ set point T° flow / T° return (w/modulating pump and return temperature sensor connected only)	00 10 - 40	00 = Disabled Displayed in °C
P23	Modulating pump minimum speed (w/modulating pump and return temperature sensor connected only)	50 - 70	Displayed in percentage
P24	Modulating pump maximum speed (w/modulating pump and return temperature sensor connected only)	70 - 100	Displayed in percentage
P25	$\Delta T$ timing T° flow / T° return (w/modulating pump and return temperature sensor connected only)	20 - 100	Displayed in seconds

**NOTES:**

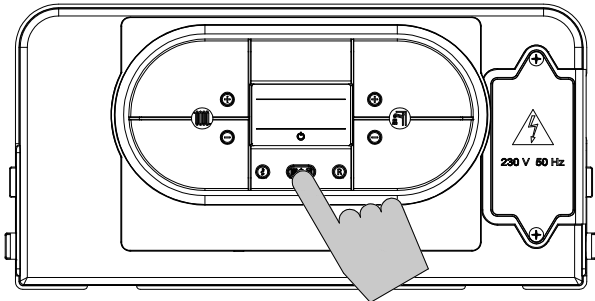
P04 - This parameter allows to modify the time the boiler takes (in heating mode) to reach the maximum power set.



P10, P11, P12 - These parameters are automatically set according to the output value set in Parameter P00.

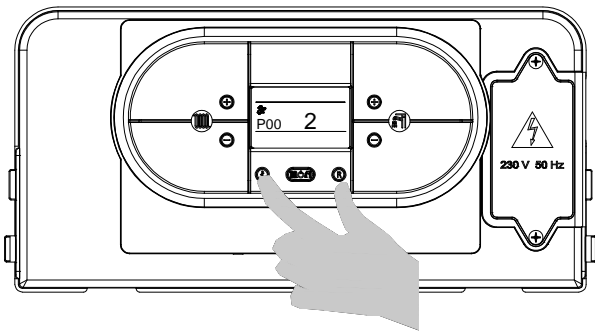
P13 - The maximum boiler power, in heating mode, can be set according to the paragraph 5.5 "Heating output (Kw) – Fan frequency (Hz) diagram".




## 5.2 Accessing the parameters menu

To modify the preset values of the parameters reported in the previous table, open the parameter settings menu as follows:

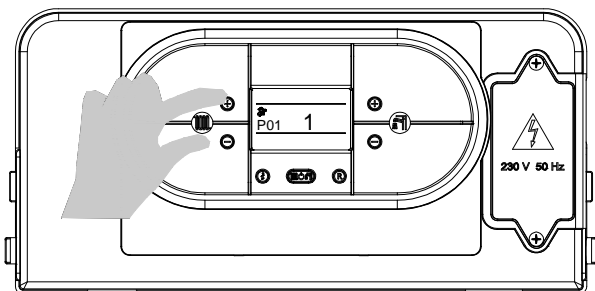





1. Place mode selection button  in OFF position, visualized by  symbol;



2. Keep pressed '' and '' buttons simultaneously and wait for  symbol and 'P00', to appear on the display.

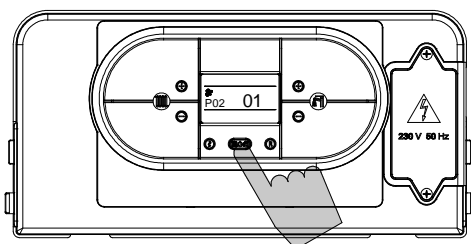
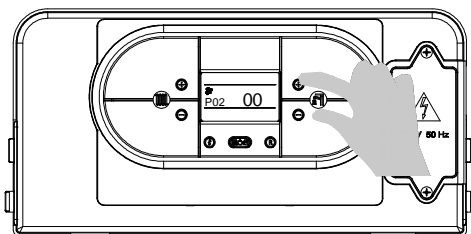
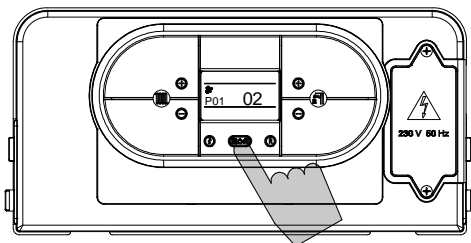
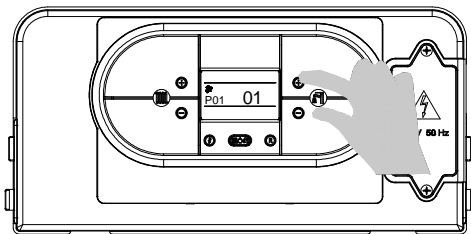
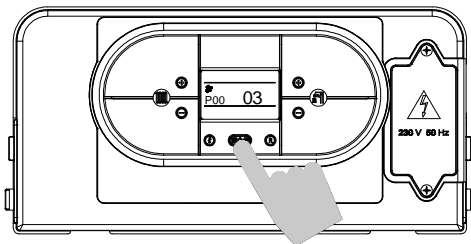
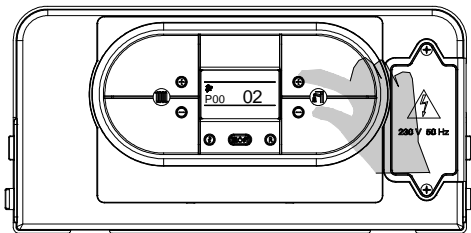
3. Release buttons '' and '';



4. Use '' and '' buttons of heating temperature setting  to select the parameter to modify;


Adjust the value of the parameter using the procedure described in the following pages.

## 5.3 Setting the parameters




### PARAMETER P00 – SELECTS THE MODEL OF BOILER

To enter the parameters menu, follow the previously described procedure (see paragraph 5.2 'Accessing the parameters menu' - steps 1-4).

5. Use '+' and '-' buttons (D.H.W temperature setting)  to modify the value of the parameter:


- 00 = 13 kW
- 01 = 18 kW
- 02 = 25 kW
- 03 = 28 kW
- 04 = 34 kW
- 05 = 50 kW
- 06 = 100 kW

6. Press mode selection button  to confirm and to render the new parameter operative.

7. To exit from the parameters menu, press simultaneously 'i' and 'R' buttons.

### PARAMETER P01 – SELECTS THE TYPE OF BOILER

To enter the parameters menu, follow the previously described procedure (see paragraph 5.2 'Accessing the parameters menu' - steps 1-4).

5. Use '+' and '-' buttons (D.H.W temperature setting)  to modify the value of the parameter:


- 00 = instantaneous boiler (w/dual circuit exchanger)
- 01 = instantaneous boiler (w/secondary d.h.w plate exchanger)
- 02 = storage cylinder boiler
- 03 = boiler with Comfort storage cylinder (+7 °C)
- 04 = Comfort instantaneous boiler (w/secondary d.h.w plate exchanger and preheating function of plate heat exchanger)
- 05 = only heating boiler

6. Press mode selection button  to confirm and to render the new parameter operative.

7. To exit from the parameters menu, press simultaneously 'i' and 'R' buttons.

### PARAMETER P02 – SELECTS THE TYPE OF GAS SUPPLY

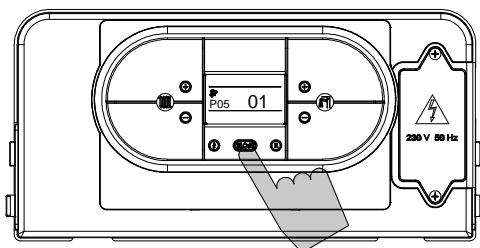
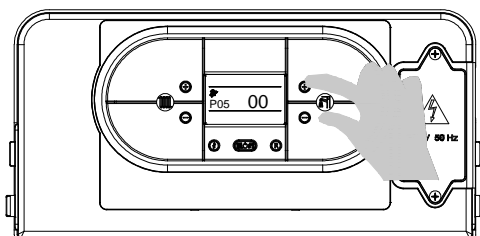
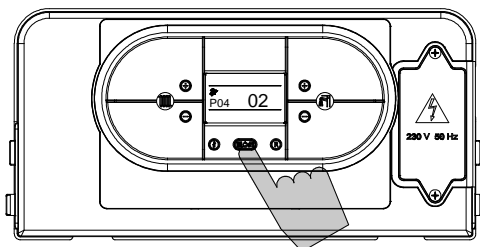
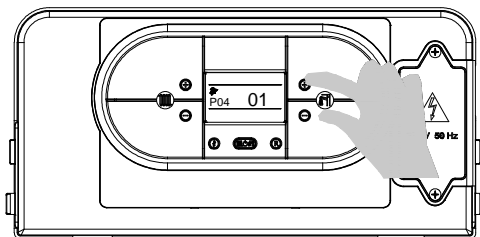
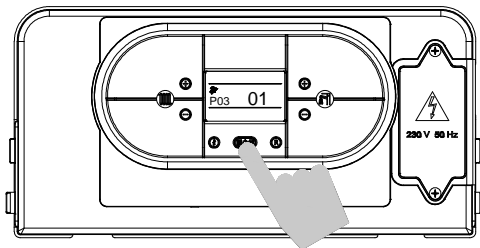
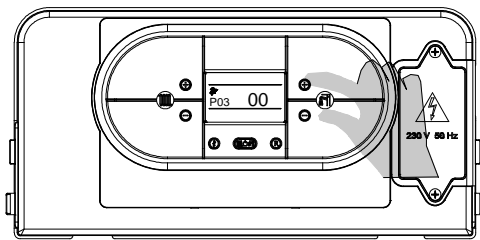
To enter the parameters menu, follow the previously described procedure (see paragraph 5.2 'Accessing the parameters menu' - steps 1-4).

5. Use '+' and '-' buttons (D.H.W temperature setting)  to modify the value of the parameter:

- 00 = Natural Gas
- 01 = LPG
- 02 = G25



6. Press mode selection button  to confirm and to render the new parameter operative.

7. To exit from the parameters menu, press simultaneously 'i' and 'R' buttons.



## PARAMETER P03 – SETS THE CENTRAL HEATING TEMPERATURE



To enter the parameters menu, follow the previously described procedure (see paragraph 5.2 'Accessing the parameters menu' - steps 1-4).

5. Use '⊕' and '⊖' buttons (D.H.W temperature setting)  to modify the value of the parameter:  
 00 = standard (30-80°C)  
 01 = reduced (25-45°C) for under-floor heating
6. Press mode selection button  to confirm and to render the new parameter operative.
7. To exit from the parameters menu, press simultaneously '⊕' and '⊖' buttons.

## PARAMETER P04 – HEATING OUTPUT RISING TIME

This parameter is used to set the time the boiler takes to reach the maximum power set, during the starting up.



To enter the parameters menu, follow the previously described procedure (see paragraph 5.2 'Accessing the parameters menu' - steps 1-4).

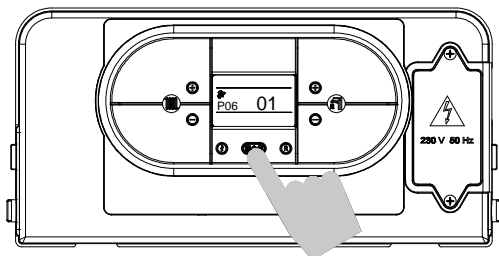
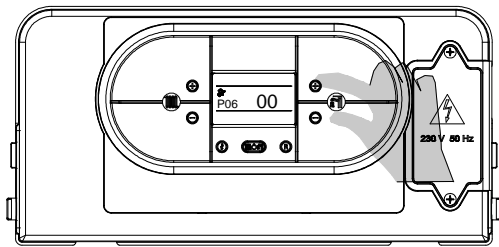
5. Use '⊕' and '⊖' buttons (D.H.W temperature setting)  to modify the value of the parameter:  
 00 = 0 seconds (disabled)  
 01 = 50 seconds (default)  
 02 = 100 seconds  
 03 = 200 seconds  
 04 = 400 seconds
6. Press mode selection button  to confirm and to render the new parameter operative.
7. To exit from the parameters menu, press simultaneously '⊕' and '⊖' buttons.

## PARAMETER P05 – WATER HAMMER PREVENTION FUNCTION

Activating this function, the D.H.W contact is delayed for 2 seconds.

To enter the parameters menu, follow the previously described procedure (see paragraph 5.2 'Accessing the parameters menu' - steps 1-4).


5. Use '⊕' and '⊖' buttons (D.H.W temperature setting)  to modify the value of the parameter:  
 00 = Off  
 01 = On
6. Press mode selection button  to confirm and to render the new parameter operative.
7. To exit from the parameters menu, press simultaneously '⊕' and '⊖' buttons.



### PARAMETER P06 – D.H.W PRIORITY FUNCTION

This parameter is used to maintain the diverter valve on D.H.W mode for a time equal to the post-circulation, keeping hot the secondary heat exchanger.

To enter the parameters menu, follow the previously described procedure (see paragraph 5.2 'Accessing the parameters menu' - steps 1-4).

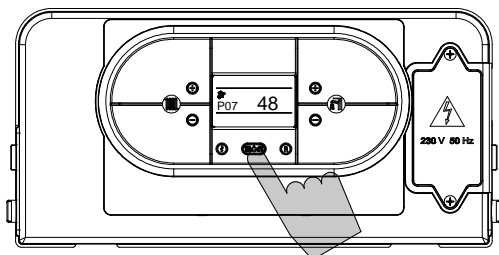
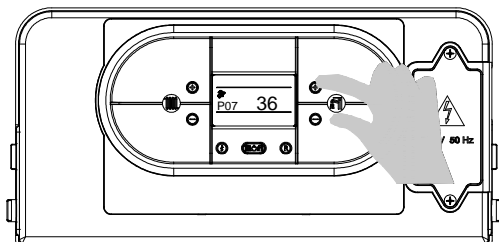
5. Use '⊕' and '⊖' buttons (D.H.W temperature setting)  to modify the value of the parameter:

00 = Off

01 = On

6. Press mode selection button  to confirm and to render the new parameter operative.


7. To exit from the parameters menu, press simultaneously '⊕' and '⊖' buttons.



### PARAMETER P07 – CENTRAL HEATING TIMER

This parameter is used to set the minimum time in which the burner is kept switched off, once the heating flow temperature has exceeded the temperature set by the user.

To enter the parameters menu, follow the previously described procedure (see paragraph 5.2 'Accessing the parameters menu' - steps 1-4).

5. Use '⊕' and '⊖' buttons (D.H.W temperature setting)  to modify the value of the parameter within the prescribed limits (displayed in multiples of 5 seconds):

min = 00

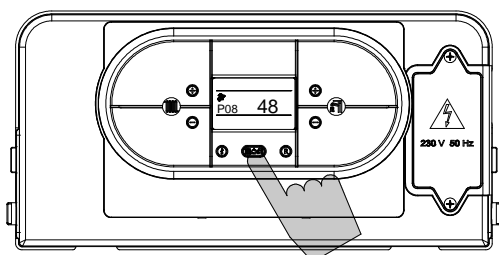
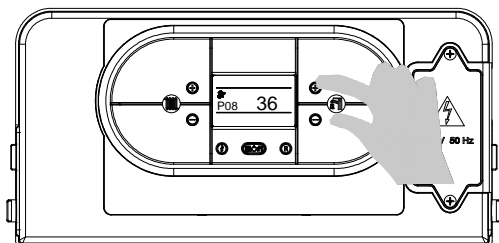
max = 90

For ex.:  $90 = 90 \times 5'' = 450''$  (7,5 min)

The default value is  $36 = 180'' = 3$  min

6. Press mode selection button  to confirm and to render the new parameter operative.


7. To exit from the parameters menu, press simultaneously '⊕' and '⊖' buttons.



### PARAMETER P08 – CENTRAL HEATING PUMP OVERRUN TIMER

This parameter is used to set the pump functioning time, in heating mode, after switching off the main burner for the intervention of the room thermostat.

To enter the parameters menu, follow the previously described procedure (see paragraph 5.2 'Accessing the parameters menu' - steps 1-4).

5. Use '⊕' and '⊖' buttons (D.H.W temperature setting)  to modify the value of the parameter within the prescribed limits (displayed in multiples of 5 seconds):

min = 00

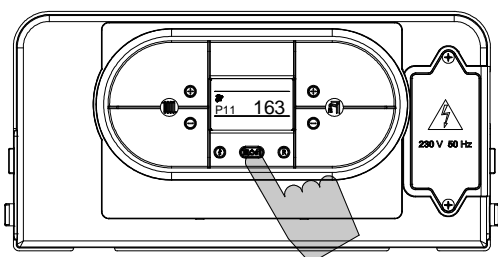
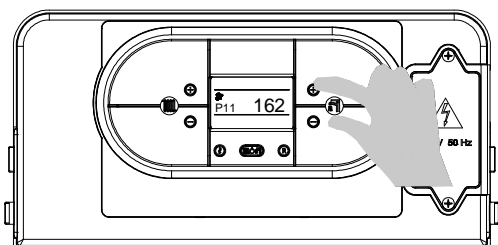
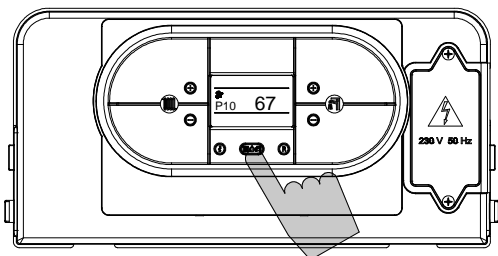
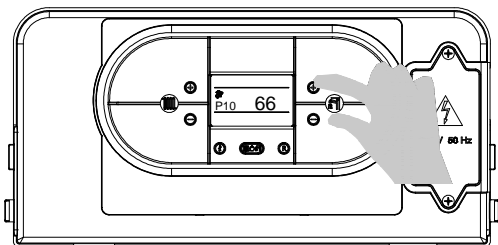
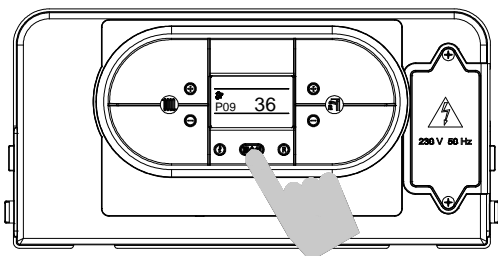
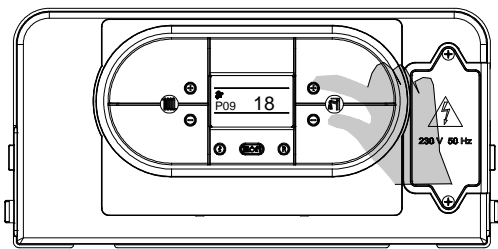
max = 90

For ex.:  $90 = 90 \times 5'' = 450''$  (7,5 min)

The default value is  $36 = 180'' = 3$  min

6. Press mode selection button  to confirm and to render the new parameter operative.


7. To exit from the parameters menu, press simultaneously '⊕' and '⊖' buttons.



### PARAMETER P09 – D.H.W/STORAGE CYLINDER PUMP OVERRUN TIMER

This parameter is used to set the pump functioning time, in D.H.W mode, after closing the water tap.

To enter the parameters menu, follow the previously described procedure (see paragraph 5.2 'Accessing the parameters menu' - steps 1-4).

5. Use '⊕' and '⊖' buttons (D.H.W temperature setting)  to modify the value of the parameter within the prescribed limits (displayed in multiples of 5 seconds):

min = 00

max = 90

For ex.:  $90 = 90 \times 5'' = 450''$  (7,5 min)

The default value is  $18 = 90'' = 1.5$  min


6. Press mode selection button  to confirm and to render the new parameter operative.

7. To exit from the parameters menu, press simultaneously '⊕' and '⊖' buttons.

### PARAMETER P10 – SETS THE MINIMUM FAN SPEED

This parameter is used to set the minimum fan speed which corresponds to the minimum burner output.


To enter the parameters menu, follow the previously described procedure (see paragraph 5.2 'Accessing the parameters menu' - steps 1-4).

5. Use '⊕' and '⊖' buttons (D.H.W temperature setting)  to modify the value of the parameter within the prescribed limits (displayed in Hertz):

min = 33 Hz

max = Value set in parameter P11

The default value is set according to the output value set in Parameter P00.


6. Press mode selection button  to confirm and to render the new parameter operative.

7. To exit from the parameters menu, press simultaneously '⊕' and '⊖' buttons.

### PARAMETER P11 – SETS THE MAXIMUM FAN SPEED

This parameter is used to set the maximum fan speed which corresponds to the maximum burner output.


To enter the parameters menu, follow the previously described procedure (see paragraph 5.2 'Accessing the parameters menu' - steps 1-4).

5. Use '⊕' and '⊖' buttons (D.H.W temperature setting)  to modify the value of the parameter within the prescribed limits (displayed in Hertz):

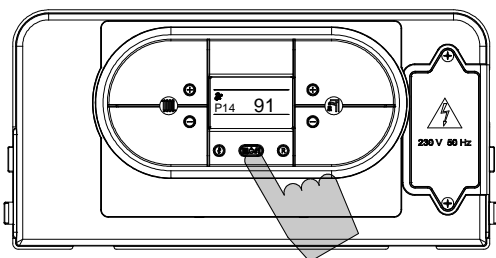
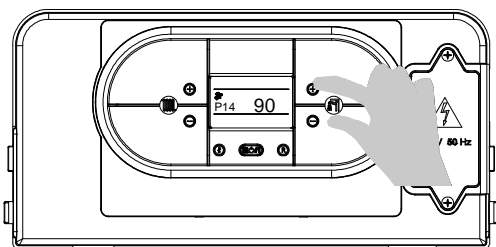
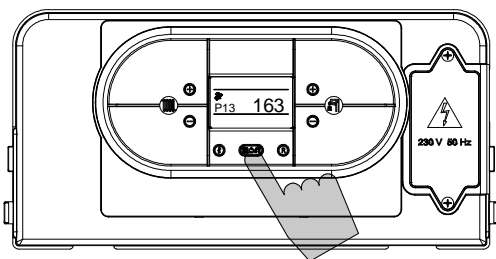
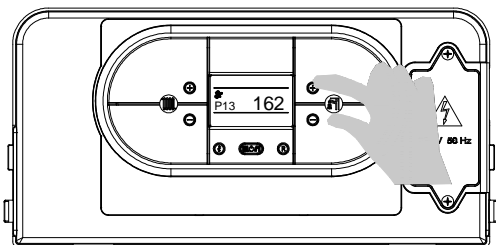
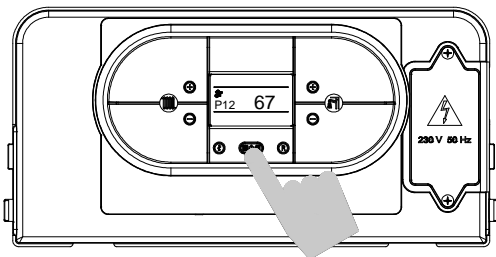
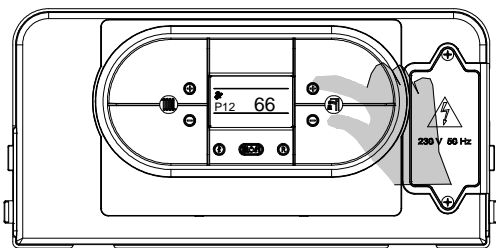
min = Value set in parameter P10

max = 203 Hz

The default value is set according to the output value set in Parameter P00.

6. Press mode selection button  to confirm and to render the new parameter operative.


7. To exit from the parameters menu, press simultaneously '⊕' and '⊖' buttons.



## PARAMETER P12 – SETS THE MINIMUM FAN SPEED (CENTRAL HEATING)

This parameter is used to set the minimum fan speed in heating mode, which corresponds to the minimum burner output during a heating mode request.


To enter the parameters menu, follow the previously described procedure (see paragraph 5.2 'Accessing the parameters menu' - steps 1-4).

5. Use '⊕' and '⊖' buttons (D.H.W temperature setting)  to modify the value of the parameter within the prescribed limits (displayed in Hertz):

min = 33 Hz

max = Value set in parameter P13

The default value is set according to the output value set in Parameter P00.


6. Press mode selection button  to confirm and to render the new parameter operative.

7. To exit from the parameters menu, press simultaneously 'ⓘ' and 'Ⓜ' buttons.

## PARAMETER P13 – SETS THE MAXIMUM FAN SPEED (CENTRAL HEATING)

This parameter is used to set the maximum fan speed in heating mode, which corresponds to the maximum burner output during a heating mode request [see paragraph 5.5 Heating output (kW) – Fan frequency (Hz) diagram].


To enter the parameters menu, follow the previously described procedure (see paragraph 5.2 'Accessing the parameters menu' - steps 1-4).

5. Use '⊕' and '⊖' buttons (D.H.W temperature setting)  to modify the value of the parameter within the prescribed limits (displayed in Hertz):

min = Value set in parameter P12

max = 203 Hz

The default value is set according to the output value set in Parameter P00.


6. Press mode selection button  to confirm and to render the new parameter operative.

7. To exit from the parameters menu, press simultaneously 'ⓘ' and 'Ⓜ' buttons.

## PARAMETER P14 – SETS THE IGNITION SEQUENCE

This parameter is used to set the fan speed during the starting up of the boiler.


To enter the parameters menu, follow the previously described procedure (see paragraph 5.2 'Accessing the parameters menu' - steps 1-4).

5. Use '⊕' and '⊖' buttons (D.H.W temperature setting)  to modify the value of the parameter within the prescribed limits (displayed in Hertz):

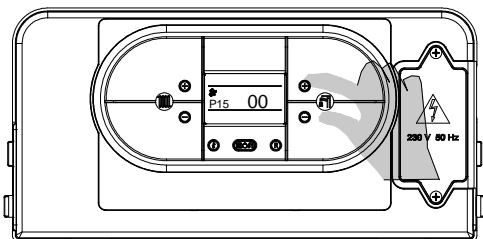
min = Value set in parameter P10

max = 203 Hz

The default value is set according to the output value set in Parameter P00.

6. Press mode selection button  to confirm and to render the new parameter operative.

7. To exit from the parameters menu, press simultaneously 'ⓘ' and 'Ⓜ' buttons.



### PARAMETER P15 – LEGIONELLA PREVENTION FUNCTION (For storage boilers only)

To enter the parameters menu, follow the previously described procedure (see paragraph 5.2 'Accessing the parameters menu' - steps 1-4).

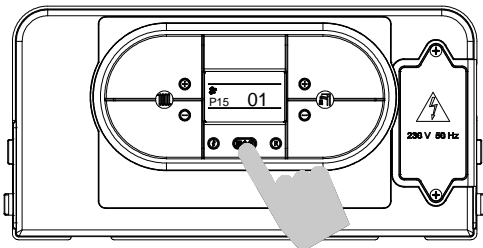
5. Use '⊕' and '⊖' buttons (D.H.W temperature setting) to modify the value of the parameter:

00 = Off

01 = On

6. Press mode selection button to confirm and to render the new parameter operative.

7. To exit from the parameters menu, press simultaneously '⊕' and '⊖' buttons.



### PARAMETER P16 – SETS THE CLIMATIC COMPENSATION CURVE (w/outdoor temperature sensor only installation)

The installation of an outdoor temperature sensor (see paragraph 6.6 'Electrical connections') allows to automatically modify the flow temperature in accordance to the outdoor temperature. The factor governing the correction is the **Kd** thermoregulation value, indicating the flow temperature range selected (fig.1).

The selection of the compensation curve is determined by the maximum flow temperature **Tm** and the minimum outdoor temperature **Te** taking into consideration the house insulation degree.

The values of the flow temperature **Tm**, refer to standard 30-80 °C appliances or 25-45 °C for under-floor heating systems. The type of appliance can be set using parameter **P03**.

To enter the parameters menu, follow the previously described procedure (see paragraph 5.2 'Accessing the parameters menu' - steps 1-4) and select parameter P16.

5. Use '⊕' and '⊖' buttons (D.H.W temperature setting) to modify the value of the parameter within the range of setting from 00 to 30.

The value corresponds to the graph curves in figure n.1.

6. Press mode selection button to confirm and to render the new parameter operative.

7. To exit from the parameters menu, press simultaneously '⊕' and '⊖' buttons.

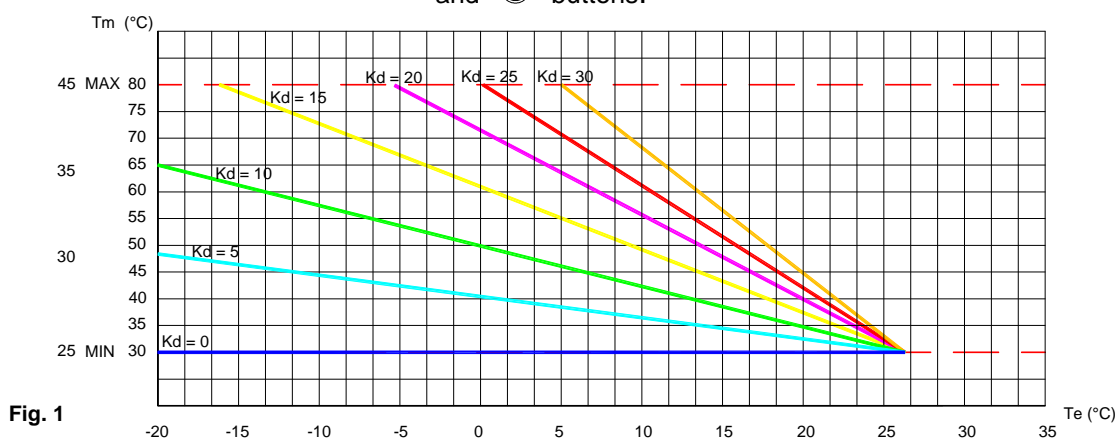
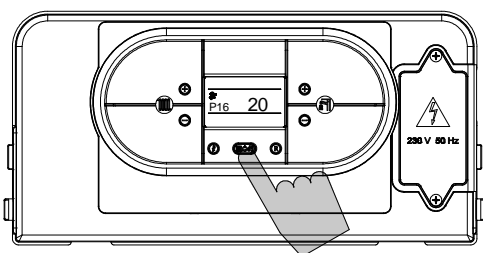
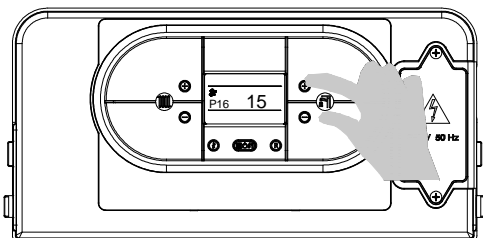
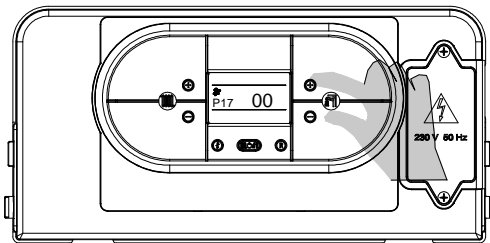


Fig. 1






### PARAMETER P17 – SETS THE TEMPERATURE MEASUREMENT UNIT


This parameter is used to set the temperature measurement unit displayed: Celsius (°C) or Fahrenheit (°F) degrees.

To enter the parameters menu, follow the previously described procedure (see paragraph 5.2 'Accessing the parameters menu' - steps 1-4).

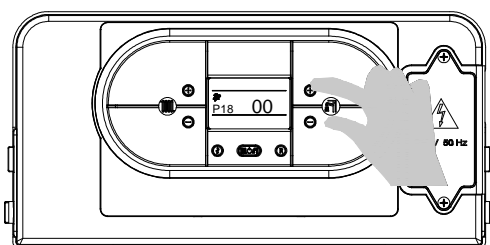
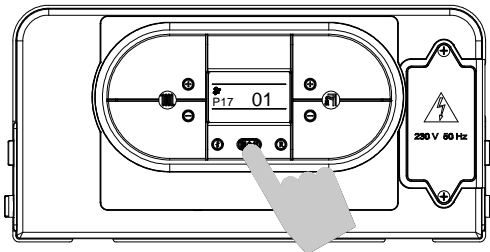
5. Use '⊕' and '⊖' buttons (D.H.W temperature setting)  to modify the value of the parameter:

00 = °C

01 = °F

6. Press mode selection button  to confirm and to render the new parameter operative.


7. To exit from the parameters menu, press simultaneously 'i' and 'R' buttons.



### PARAMETER P18 – SETS THE 0-10V INDUSTRIAL BUS PILOTING

This parameter is used to enable/disable the 0-10V industrial bus in order to set the burner output and the flow temperature by outdoor bus.


To enter the parameters menu, follow the previously described procedure (see paragraph 5.2 'Accessing the parameters menu' - steps 1-4).

5. Use '⊕' and '⊖' buttons (D.H.W temperature setting)  to modify the value of the parameter:

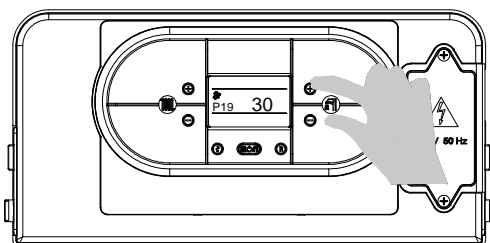
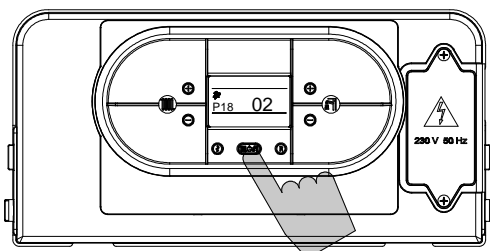
00 = Disabled

01 = Flow temperature control mode

02 = Burner output control mode

6. Press mode selection button  to confirm and to render the new parameter operative.


7. To exit from the parameters menu, press simultaneously 'i' and 'R' buttons.



### PARAMETER P19 – CENTRAL HEATING MINIMUM SET POINT

This parameter is used to set the central heating minimum user set point.

To enter the parameters menu, follow the previously described procedure (see paragraph 5.2 'Accessing the parameters menu' - steps 1-4).

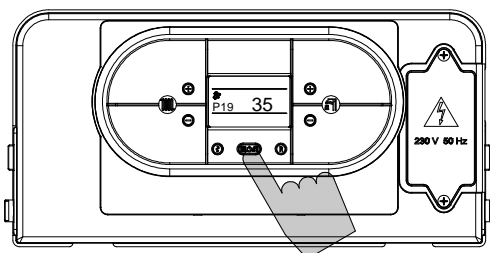
5. Use '⊕' and '⊖' buttons (D.H.W temperature setting)  to modify the value of the parameter within the prescribed limits (displayed in Celsius degrees):

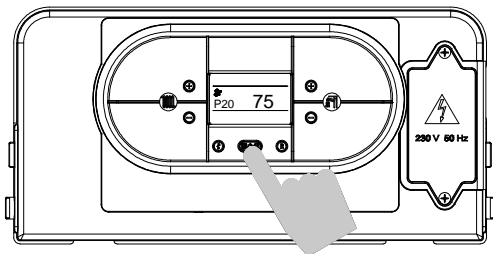
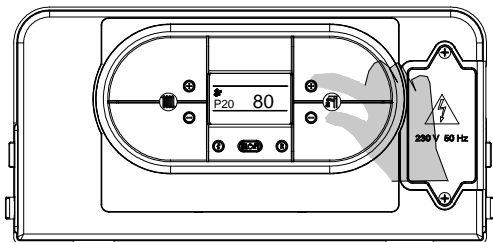
min = 20 °C

max = 40 °C

6. Press mode selection button  to confirm and to render the new parameter operative.

7. To exit from the parameters menu, press simultaneously 'i' and 'R' buttons.





### PARAMETER P20 – CENTRAL HEATING MAXIMUM SET POINT

This parameter is used to set the central heating maximum user set point.

To enter the parameters menu, follow the previously described procedure (see paragraph 5.2 'Accessing the parameters menu' - steps 1-4).

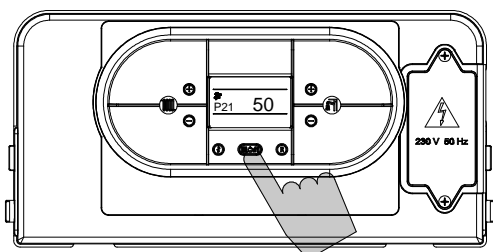
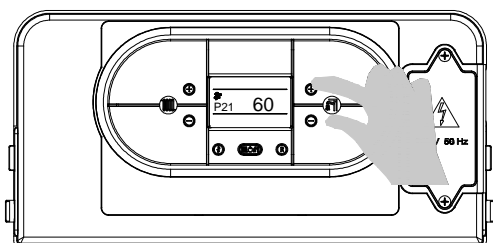
5. Use '⊕' and '⊖' buttons (D.H.W temperature setting) to modify the value of the parameter within the prescribed limits (displayed in Celsius degrees):

min = 40 °C

max = 90 °C

6. Press mode selection button to confirm and to render the new parameter operative.

7. To exit from the parameters menu, press simultaneously 'i' and 'R' buttons.



### PARAMETER P21 – D.H.W. MAXIMUM SET POINT

This parameter is used to set the D.H.W maximum user set point.

To enter the parameters menu, follow the previously described procedure (see paragraph 5.2 'Accessing the parameters menu' - steps 1-4).

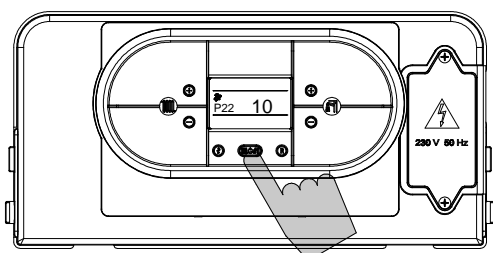
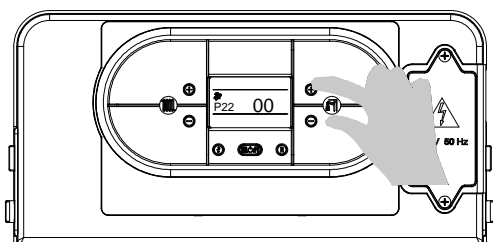
5. Use '⊕' and '⊖' buttons (D.H.W temperature setting) to modify the value of the parameter within the prescribed limits (displayed in Celsius degrees):

min = 45 °C

max = 75 °C

6. Press mode selection button to confirm and to render the new parameter operative.

7. To exit from the parameters menu, press simultaneously 'i' and 'R' buttons.



### PARAMETER P22 – ΔT SET POINT T° FLOW / T° RETURN

(w/modulating pump and return temperature sensor connected only)

This parameter is used to set the delta value between the flow and the return temperature.

To enter the parameters menu, follow the previously described procedure (see paragraph 5.2 'Accessing the parameters menu' - steps 1-4).

5. Use '⊕' and '⊖' buttons (D.H.W temperature setting) to modify the value of the parameter within the prescribed limits (displayed in Celsius degrees):

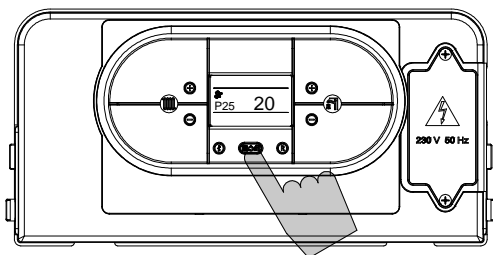
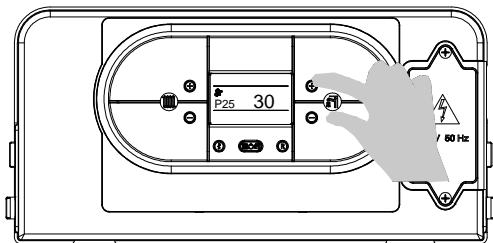
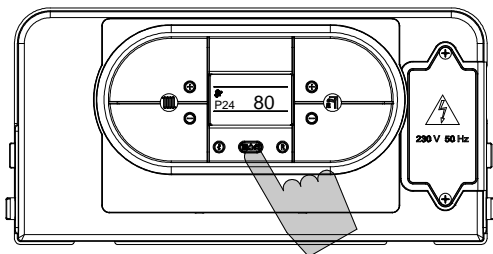
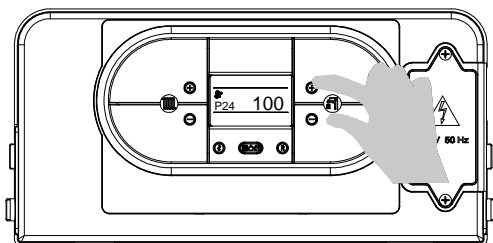
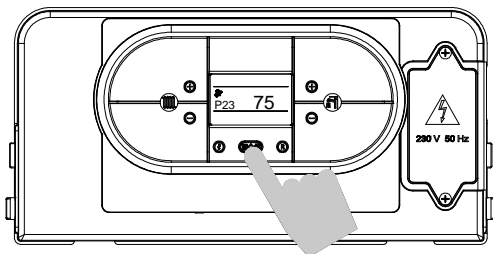
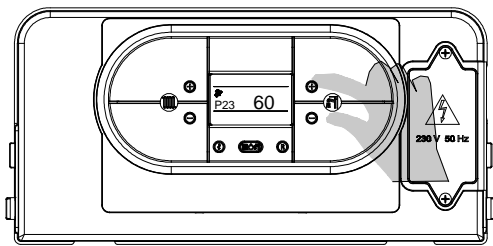
00 = Disabled

min = 10 °C

max = 40 °C

6. Press mode selection button to confirm and to render the new parameter operative.


7. To exit from the parameters menu, press simultaneously 'i' and 'R' buttons.



### PARAMETER P23 – MODULATING PUMP MINIMUM SPEED (w/modulating pump and return temperature sensor connected only)

This parameter is used to set the minimum modulating pump speed during a heating mode request.

To enter the parameters menu, follow the previously described procedure (see paragraph 5.2 'Accessing the parameters menu' - steps 1-4).

5. Use '⊕' and '⊖' buttons (D.H.W temperature setting)  to modify the value of the parameter within the prescribed limits (displayed in percentage):

min = 50 %

max = 70 %


6. Press mode selection button  to confirm and to render the new parameter operative.

7. To exit from the parameters menu, press simultaneously 'ⓘ' and 'Ⓜ' buttons.

### PARAMETER P24 – MODULATING PUMP MAXIMUM SPEED (w/modulating pump and return temperature sensor connected only)


This parameter is used to set the maximum modulating pump speed during a heating mode request.

To enter the parameters menu, follow the previously described procedure (see paragraph 5.2 'Accessing the parameters menu' - steps 1-4).

5. Use '⊕' and '⊖' buttons (D.H.W temperature setting)  to modify the value of the parameter within the prescribed limits (displayed in percentage):

min = 70 %

max = 100 %


6. Press mode selection button  to confirm and to render the new parameter operative.

7. To exit from the parameters menu, press simultaneously 'ⓘ' and 'Ⓜ' buttons.

### PARAMETER P25 – ΔT TIMING T° FLOW / T° RETURN (w/modulating pump and return temperature sensor connected only)


This parameter is used to set the timing response of the modulating pump.

To enter the parameters menu, follow the previously described procedure (see paragraph 5.2 'Accessing the parameters menu' - steps 1-4).

5. Use '⊕' and '⊖' buttons (D.H.W temperature setting)  to modify the value of the parameter within the prescribed limits (displayed in seconds):

min = 20

max = 100

6. Press mode selection button  to confirm and to render the new parameter operative.

7. To exit from the parameters menu, press simultaneously 'ⓘ' and 'Ⓜ' buttons.

## 5.4 Gas data

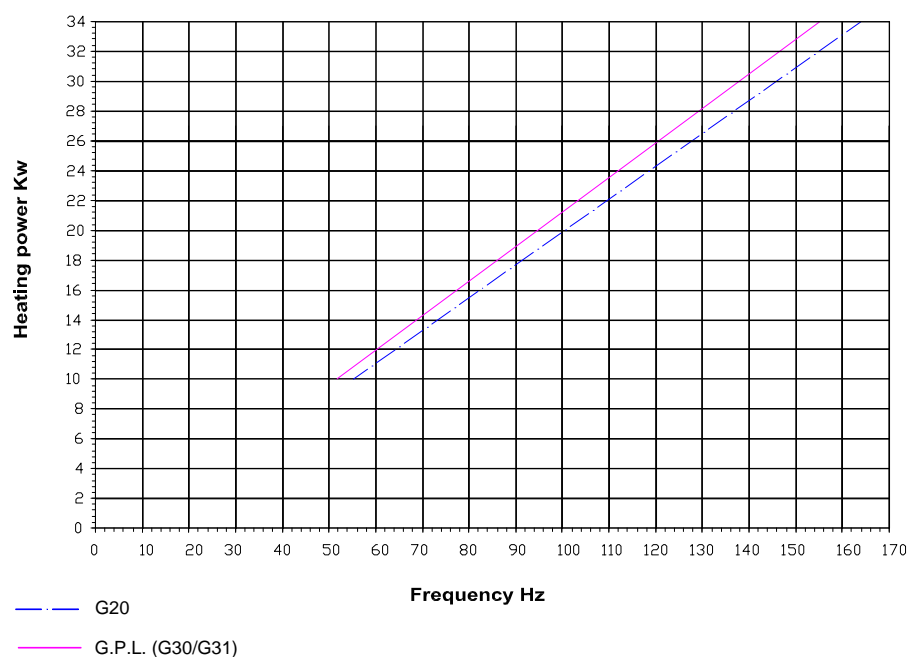
### Technical data tables

CO <sub>2</sub> Values	
Gas type	CO <sub>2</sub> %
Natural gas - G20	9.18
Liquid Butan Gas - G 30	10.3
Liquid Propane Gas - G 31	10.3


Frequency		
Gas type	Minimum Central Heating (Hz)	Maximum Central Heating (Hz)
Natural gas - G20	55	164
Liquid Butan Gas - G 30	52	155
Liquid Propane Gas - G 31	52	155

Gas data table				
		NATURAL GAS G20	LIQUID BUTANE GAS G30	LIQUID PROPANE GAS G31
Indice di Wobbe inferiore (15°C; 1013 mbar)	MJ/Nm <sup>3</sup>	45.67	80.58	70.69
Pressione nominale di alimentazione	mbar	20	30	37
Consumi (15°C; 1013 mbar)	m <sup>3</sup> /h	3.6	-	-
Consumi (15°C; 1013 mbar)	kg/h	-	2.68	2.64

## 5.5 Heating Power (kW) – Fan frequency (Hz) diagram



## 5.6 Converting the boiler to a different gas type

 The conversion of a boiler from burning natural gas to LPG, or vice versa, must be carried out exclusively by professionally qualified personnel, registered in accordance with current legislation and authorized by Radiant Bruciatori Spa.





 Check that the gas supply pipe is suitable for the new fuel type.

Conversion is performed as follows:

- select the new gas type by changing parameter **P02** on the control panel (see 5.3 “Setting the parameters”);
- Proceed with the adjustment of the CO<sub>2</sub> combustion value (see ‘4.6 CO<sub>2</sub> Value adjustment’).

## 6. **MAINTENANCE** (authorised personnel)

### 6.1 General Warnings

-  All maintenance operations must be carried out by professionally qualified personnel, authorised by Radiant Bruciatori Spa.
-  The frequency of boiler maintenance must comply with current law and, nevertheless, should be carried out once a year.
-  In order to guarantee the long life of the appliance and in accordance with the current gas safety regulations, only use original spare parts
-  Before carrying out any type of maintenance operation, disconnect the appliance from the mains electricity supply and close the gas valve.

### 6.2 Boiler inspection

In order to ensure that the boiler operates efficiently and safely, it is recommended that the appliance is inspected by a suitably competent technician at least once a year.

The following operations should be carried out annually

- Check the condition of the gas seals and replace where necessary.
- Check the condition of the water seals and replace where necessary.
- Visually inspect the condition of the combustion chamber and flame.
- When required, check that the combustion is correctly regulated and if necessary proceed in line with section "Commissioning the boiler".
- Remove and clean any oxidation from the burner.
- Check that the seal of the room-sealed chamber is undamaged and positioned correctly.
- Check the primary heat exchanger and clean if necessary.
- Check the maximum and minimum modulation pressures and the modulation itself.
- Check the condition and operation of the ignition and gas safety systems. If necessary, remove and clean the scaling from the ignition and flame detection electrodes, paying particular attention to replace them at the correct distance from the burner.
- Check the heating safety systems: temperature limit safety thermostat, pressure limit safety device.
- Check the pre-fill pressure of the expansion vessel (if mounted).
- For safety reasons, periodically check the integrity and operation of the flue gas exhaust system.
- Check that the connection to the mains electricity supply complies with that reported in the boiler's instruction manual.
- Check the electrical connections inside the control panel.
- Check the D.H.W flow rate (if produced) and temperature.
- Check that the condensate drain system is working correctly, including any parts of the system outside the boiler such as condensate collection devices along the length of the flue and/or any acid neutralising devices.
- Check that the condensate flows freely and that there are no exhaust fumes present within the appliance.

## 6.3 Accessing the boiler

All maintenance operations require one or more of the boiler casing panels to be removed.

The side panels can only be removed after the front panel has been removed.

### Front panel:

- Remove the fixing screws at the lower edge of the front panel.
- Grasp the lower part of the panel and pull it outwards (see fig. 1) and then up (see fig. 2).

### Left and right side panel:

- Remove the fixing screws at the front and lower edge of the side panel to remove.
- Grasp the bottom of the panel, move it sideways and then upwards to remove it.

To access the electrical connections of the control panel, proceed as follows:

**⚠ Switch off the power supply at the main switch.**

- Remove the front panel (see fig. 1 and fig. 2).
- Grasp the left and right control panel support brackets (see fig. 5) and pull them outwards, at the same time rotating the panel downwards.
- Unscrew the four fixing screws (see fig. 6) and remove the panel back piece.

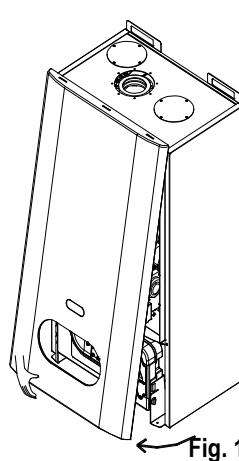


Fig. 1

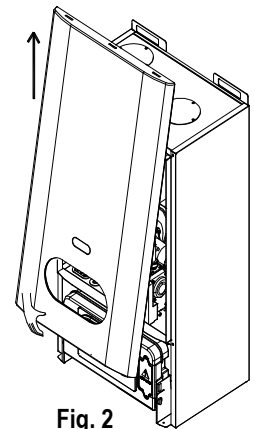


Fig. 2

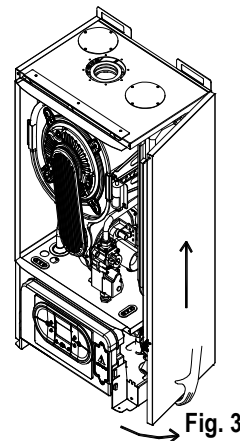


Fig. 3

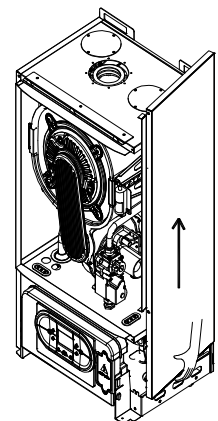


Fig. 4

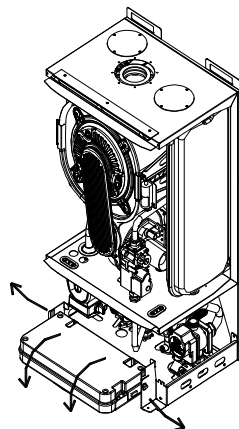


Fig. 5

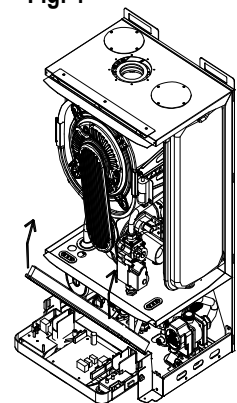
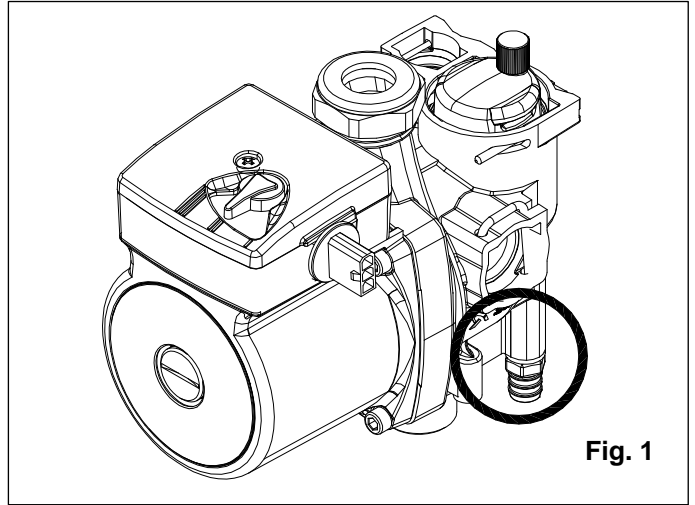


Fig. 6

## 6.4 Draining the central heating system

If the need arises to drain the system, this can be done as follows:

- Switch the system to “WINTER” mode and ignite the boiler.
- Switch off the power supply to the boiler.
- Wait for the boiler to cool down.
- Connect a hosepipe to the system drain point and locate the other end of the hose in a suitable drainage system.
- Open the system drain valve (see fig. 1).
- Open the air vents on the radiators, starting with the highest and moving down the system to the lowest.
- When the system has been drained, close the radiator breather valves and the drain valve.



**Fig. 1**



## 6.5 Maintenance operations



Before carrying out any cleaning or part replacement operations, **ALWAYS** turn off the **ELECTRICITY**, **WATER** and **GAS** supplies to the boiler.

Radiant Bruciatori S.p.a. will not be held responsible for damage to any of the boiler's components caused by non-compliance with this instruction.

For all maintenance operations requiring removal of the boiler casing, refer to the procedures described in paragraph 6.3 "Accessing the boiler".

### Cleaning the main exchanger module and combustion unit (see fig. 1)

- Disconnect the electrical connections of the electric fan.
- Disconnect the joint and remove the pipe linking the gas valve to the injector unit (venturi).
- Disconnect the joint and remove the gas feed pipe from the gas valve.
- Un-plug the ignition electrode and flame detection wires from the ignition control unit.
- Unscrew the ring-nut at the bottom of the room-sealed chamber and remove the gas valve.
- Unscrew the nuts securing the burner unit (consisting of a fan, manifold and burner) to the primary heat exchanger.
- Remove the burner unit, paying particular attention not to remove the ceramic fibre protection from the bottom of the heat exchanger.
- Check that the burner is not affected by deposits, scaling or excessive oxidation. Check that all the holes in the burner are free;
- Clean the electrodes carefully without altering their positions with respect to the burner;
- Clean the burner cylinder using a non-metal brush and without damaging the ceramic fibre;
- Check the integrity of the washer on the cover of the burner;
- Clean the heat exchanger (see fig. 2) using a household detergent for stainless steel, distributing the product on the spirals of the exchanger using a brush. Do not wet the ceramic fibre coating. Wait a few minutes then remove the deposits using a non-metal brush. Then remove the residues under running water;
- Remove the pipe clip, remove the condensate drainpipe and clean under running water.
- Unscrew the joint to the condensate trap, remove the trap and wash under running water.
- With the cleaning completed, re-assemble the components following the above procedure in reverse order.
- Finally, check the boiler to make sure that all gas and exhaust joints are tight.

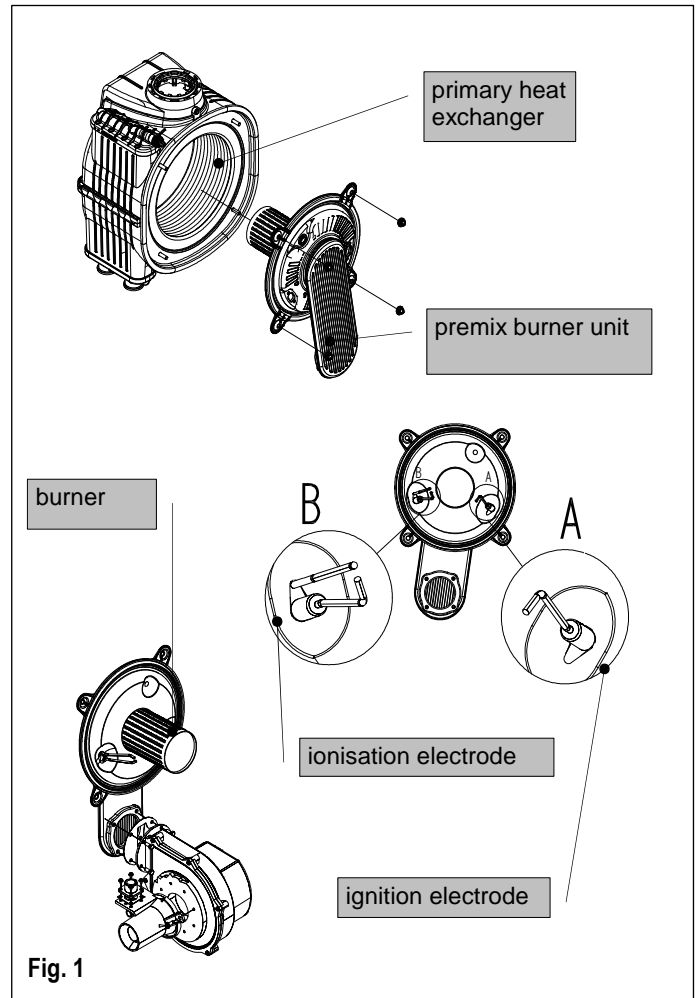


Fig. 1

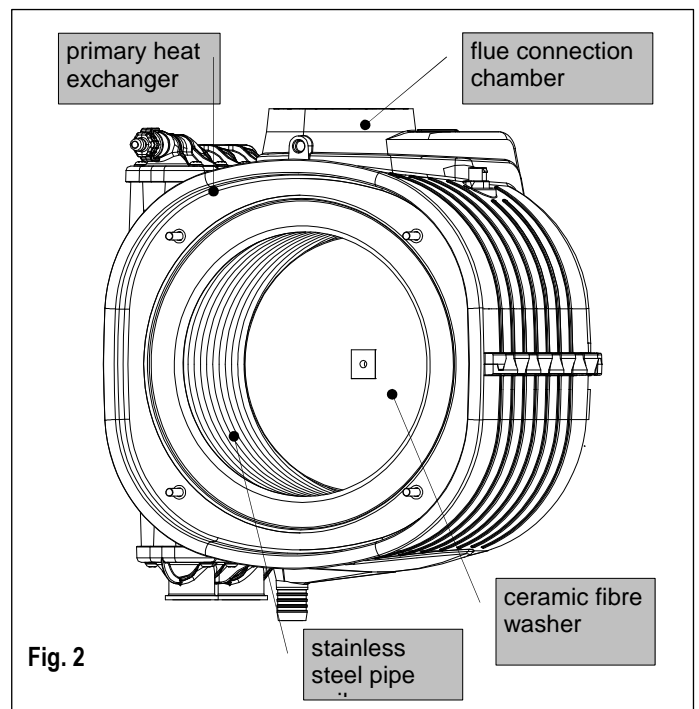


Fig. 2

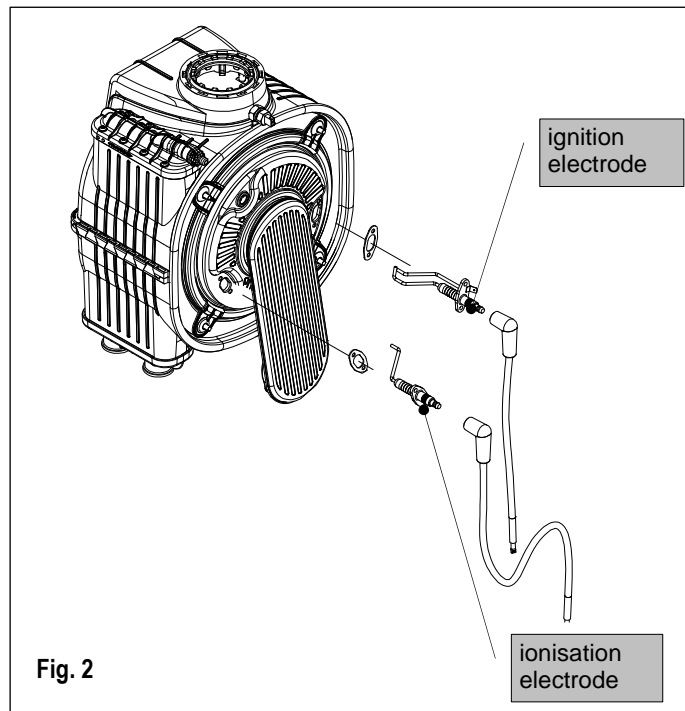
## Part replacement:

### Ignition and/or flame detection electrodes

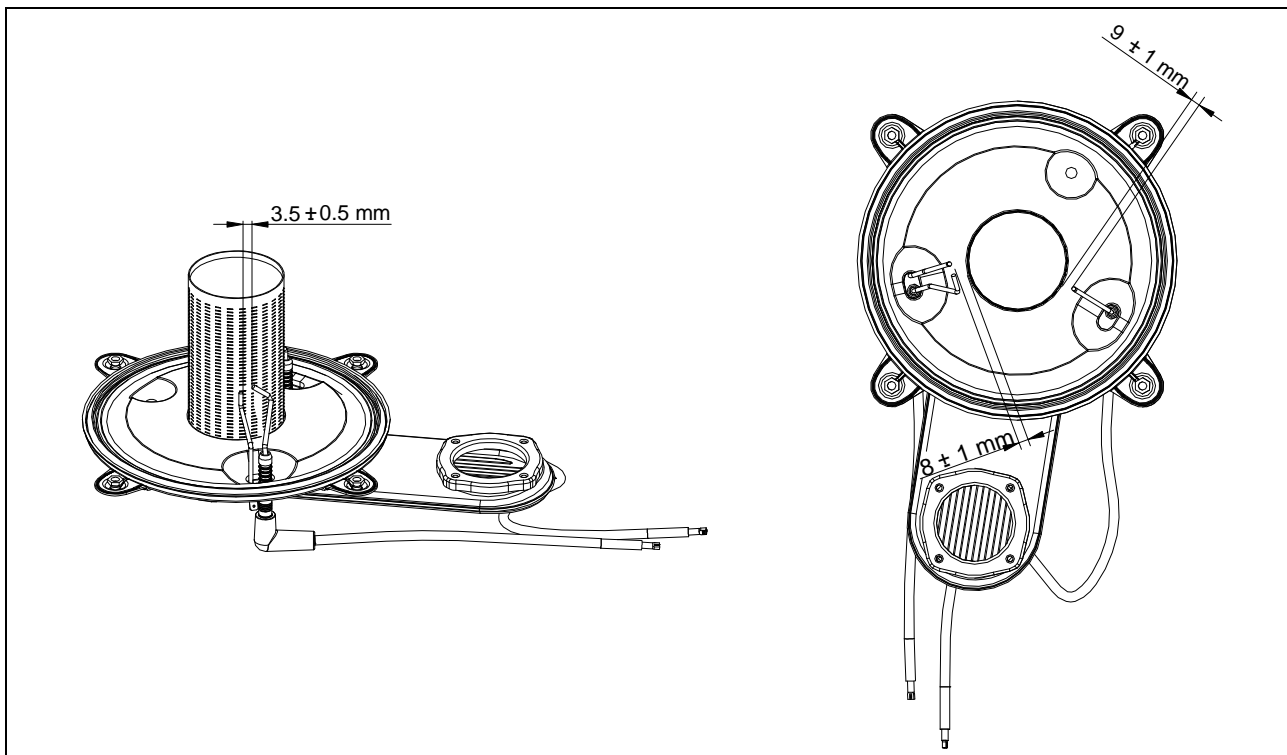
(see fig. 2)

- Un-Plug the electrode wires;
- Slacken the fixing screws;
- Remove the electrodes. When fitting the new ones, check that the seals are not damaged. Replace if necessary;
- Reconnect the wires and re-assemble the components following the above procedure in reverse order;
- Switch on the power supply and restart the appliance;

**!** *If the boiler does not restart, check the positions of the electrodes (especially the ignition electrode). Make sure that original position and distances between the electrodes and the burner are respected to avoid a boiler malfunction).*



## POSITIONING THE IGNITION ELECTRODE AND THE IONISATION ELECTRODE

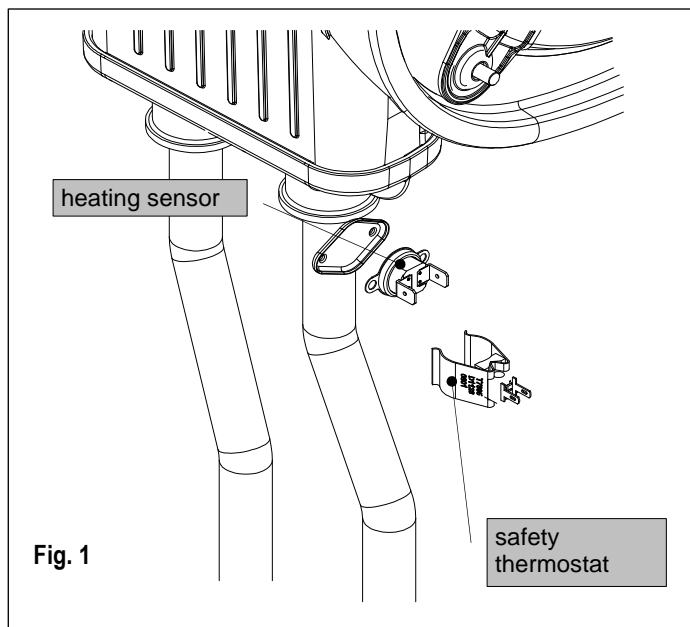


### Safety thermostat (see fig. 1)

- Disconnect the connecting wire;
- Unscrew the fixing screws and remove the thermostat;
- Replace the thermostat and re-assemble the components following the above procedure in reverse order;
- Switch on the electricity, water and gas supplies and restart the appliance.

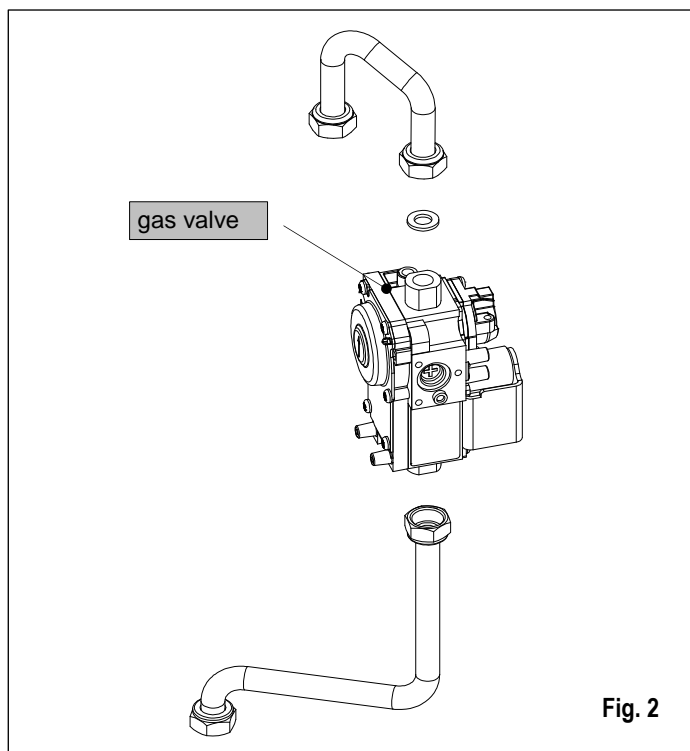
### Heating sensor (see fig. 1)

- Un-Plug the connecting wire;
- Replace the sensor and re-assemble the components following the above procedure in reverse order;
- Switch on the electricity, water and gas supplies, open the shut-off valves and fill the central heating circuit. Then restart the appliance, remembering to discharge any air that may be trapped in the system;



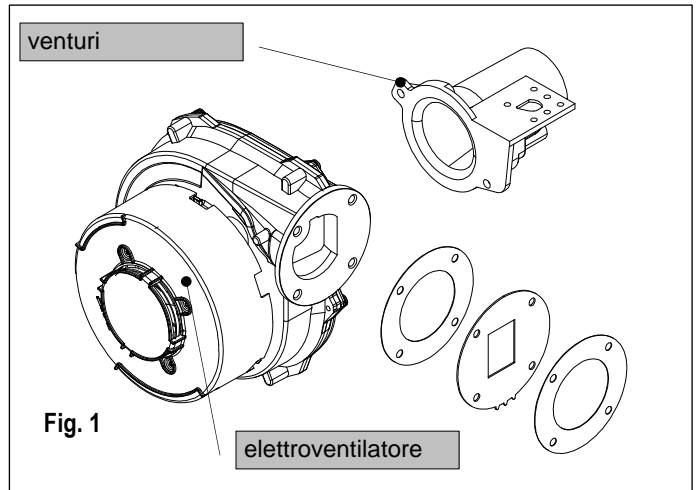
### Gas valve (see fig. 2)

- Disconnect the joints and remove the gas pipe connecting the gas valve to the venturi.
- Disconnect the gas feed pipe and valve ring-nut at the bottom of the room-sealed chamber.
- Remove the flanged elbow coupling of the existing valve and fit it to the new valve; also fit a new cork washer.
- Replace the gas valve and re-assemble the components following the above procedure in reverse order.
- Replace all the gas seals.
- Fully tighten the gas connections.
- Switch on the electricity, water and gas supplies and check for any gas leaks using a soapy solution or leak detector spray;



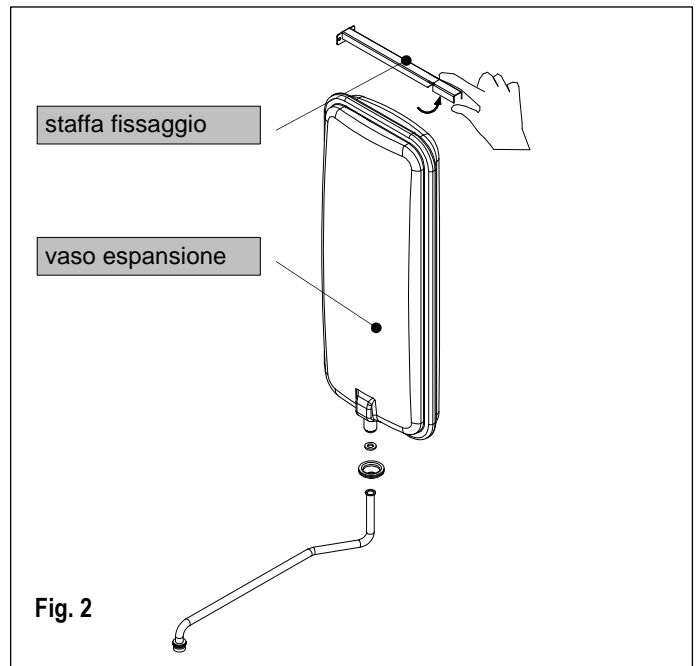
### Electric fan (see fig. 1)

- Remove and dismantle the entire burner unit (see 6.6.1 "Cleaning the burner unit").
- Use an 8 mm spanner to unscrew the four nuts securing the electric fan to the gas manifold and then remove the electric fan, noting the positions of the washer and diaphragm.
- Remove the air intake duct, unscrew the two fixing screws from the venturi and remove the electric fan, paying particular attention not to damage the cork gasket.
- Replace the electric fan and re-assemble the components following the above procedure in reverse order.
- Switch on the electricity, water and gas supplies and check the soundness of the joint by measuring the CO<sub>2</sub> levels;



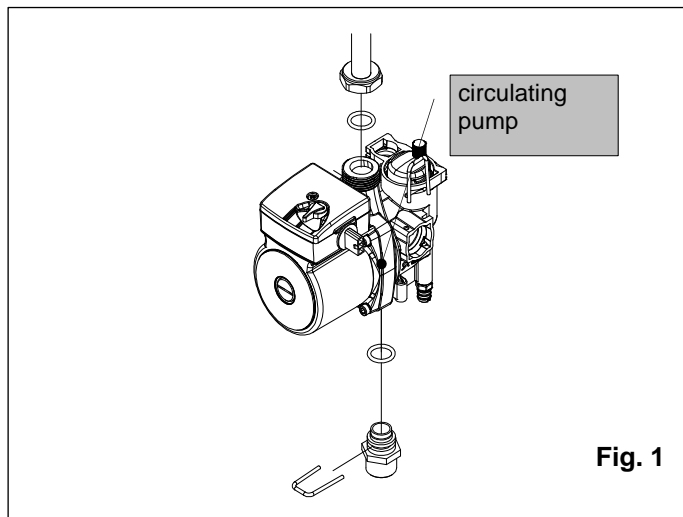
### Expansion vessel (see fig. 2)

- Close the shut-off valves and drain the central heating circuit of the boiler.
- Use a 19 mm spanner to unscrew the pipe coupling to the vessel.
- Move the top fixing bracket upwards and remove the expansion vessel by pulling it out from the front.
- Replace the expansion vessel and re-assemble the components following the above procedure in reverse order.
- Switch on the electricity, water and gas supplies and fill the system with water. Check for any leaks from the joints and bleed off any air from the circuit;



### Circulating pump (motor body) (see fig. 1)

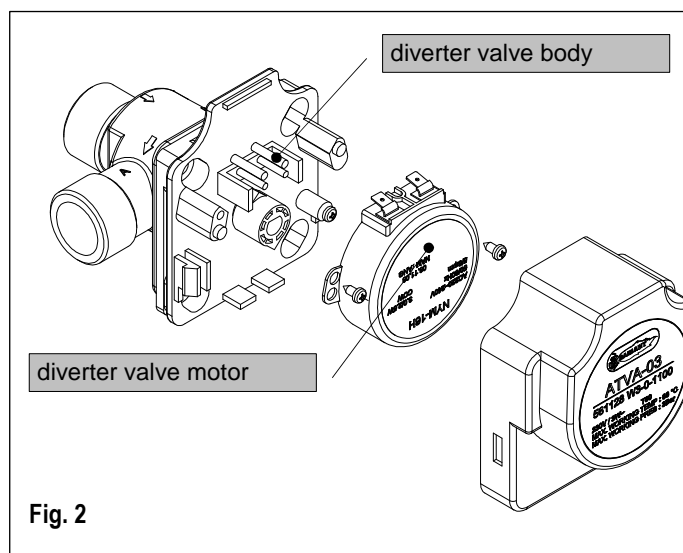
- Close the shut-off valves and drain the central heating circuit of the boiler;
- Use a 5 mm Allen key to unscrew the four screws securing the motor body to the impeller body;
- Remove the motor body and check the condition of the washer. If necessary, replace the washer;
- Replace the circulation pump and re-assemble the components following the above procedure in reverse order;
- Switch on the electricity, water and gas supplies and fill the system with water. Check for any leaks from the joints and bleed off any air from the circuit. Restart the boiler.



### Diverter valve (see fig. 2)

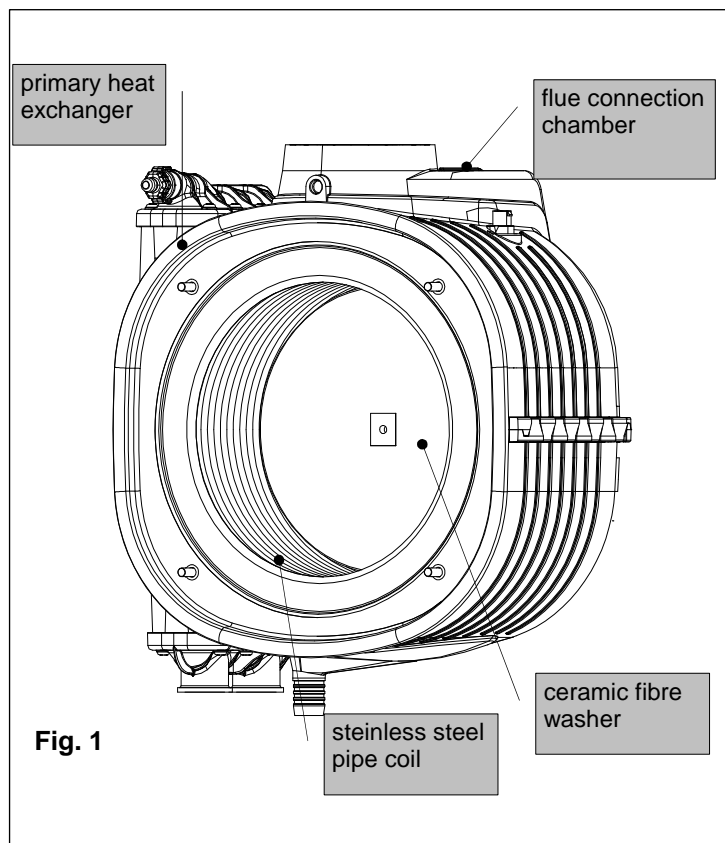
#### Replacing the diverter valve body

- Close the shut-off valves and drain the central heating circuit of the boiler;
- Unscrew the fixing screws securing the transparent cover of the diverter valve and remove the cover;
- Unscrew the four fixing screws and remove the diverter valve body and washer;
- Replace the valve body and re-assemble the components following the above procedure in reverse order;
- Switch on the electricity, water and gas supplies and fill the system with water. Check for any leaks from the joints and bleed off any air from the circuit. Restart the boiler.




### Primary heat exchanger (see fig. 1)

- Close the shut-off valves and drain the central heating circuit of the boiler;
- Switch off the power and gas supply to the boiler;
- Remove and dismantle the entire burner unit (see 6.6.1 "Cleaning the condensation module and burner unit");
- Remove the gas valve;
- Remove the spring and then the condensate drainpipe;
- Remove the fixing springs and then the delivery and return pipes;
- Remove the support brackets and pull out the heat exchanger;
- Remove the regulation sensor from the old heat exchanger and refit it together with the two condensate drainpipes to the new one;
- Replace the heat exchanger and re-assemble the components following the above procedure in reverse order;
- Switch on the electricity, water and gas supplies and fill the system with water. Check for any leaks from the joints and bleed off any air from the circuit. Restart the boiler, making sure that there are no gas leaks;



## Modulation circuit board (see fig. 1-2)

- Open the control panel (see 6.3 “Accessing the boiler”);
- Disconnect all the connectors, unscrew the four fixing screws and remove the modulation circuit board;
- Replace the circuit board and re-assemble the components following the above procedure in reverse order;
- Switch on the electricity, water and gas supplies and regulate the boiler (see 5.4 “Gas data”);

 *When replacing the modulation circuit board, it's necessary to set parameter according to the boiler model (see 5.3 “Setting the parameters”).*

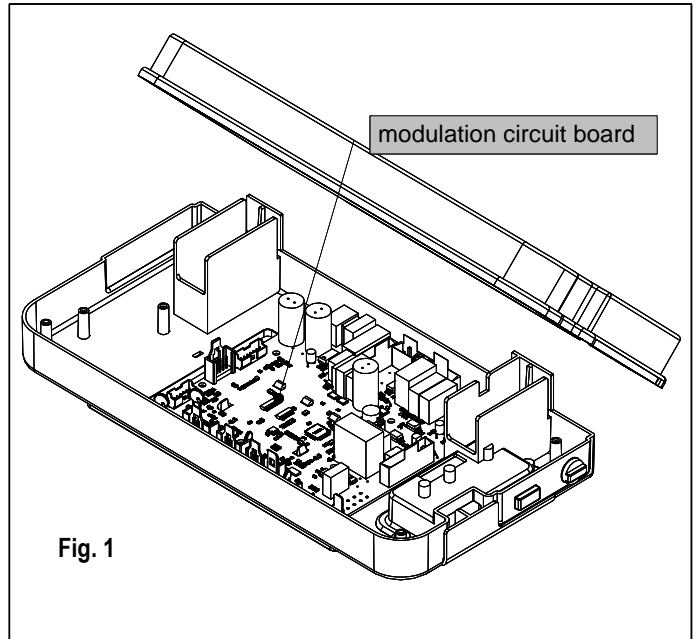


Fig. 1

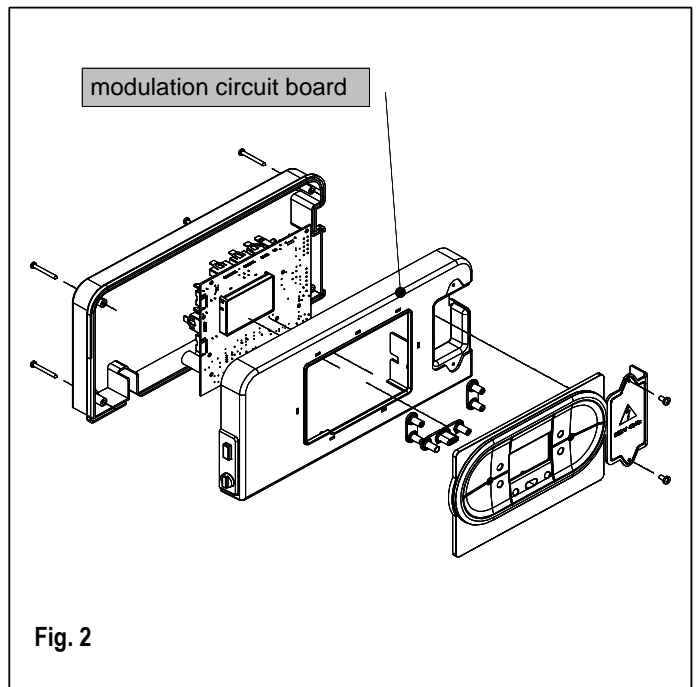
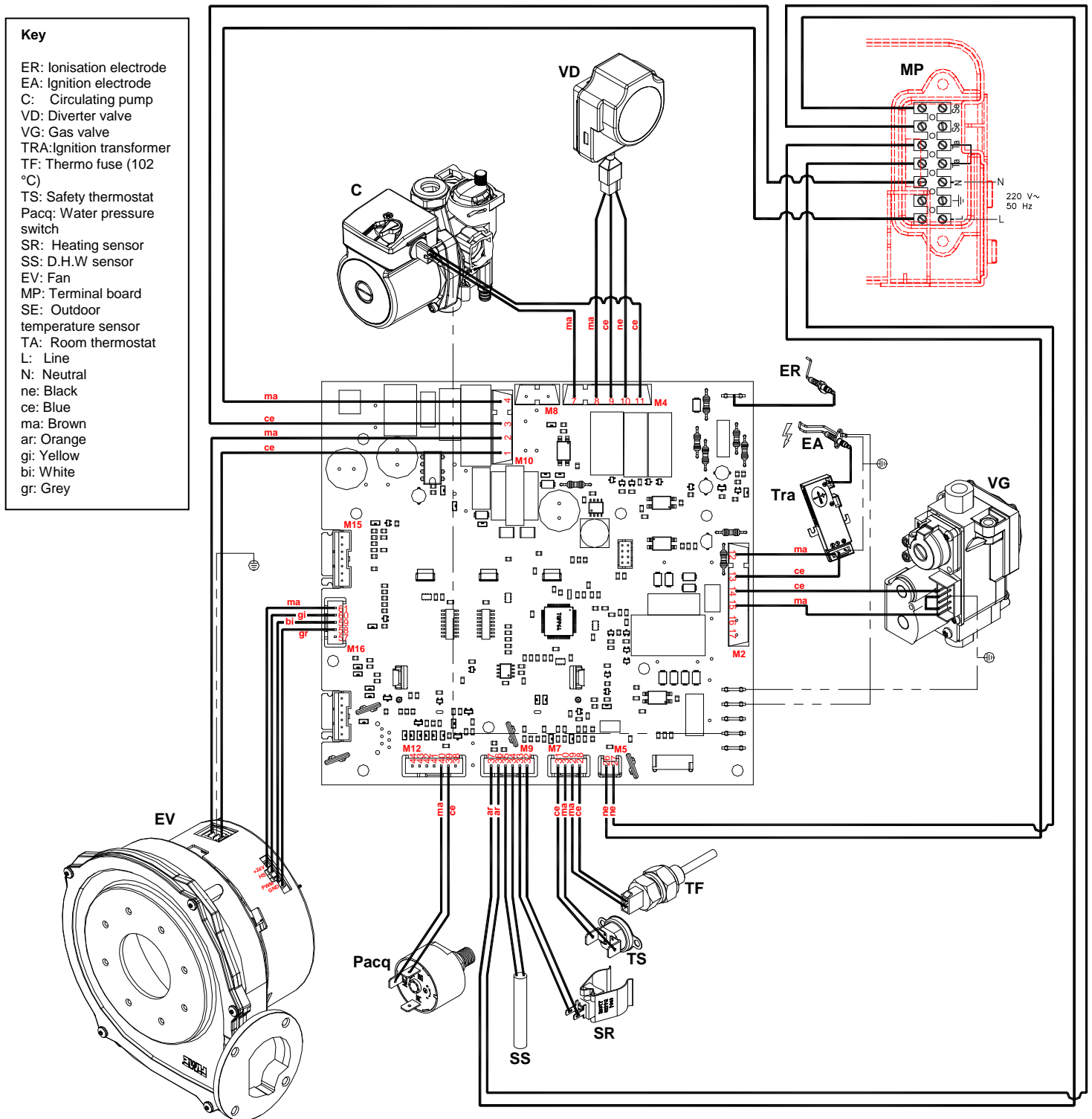


Fig. 2

## 6.6 Wiring diagrams

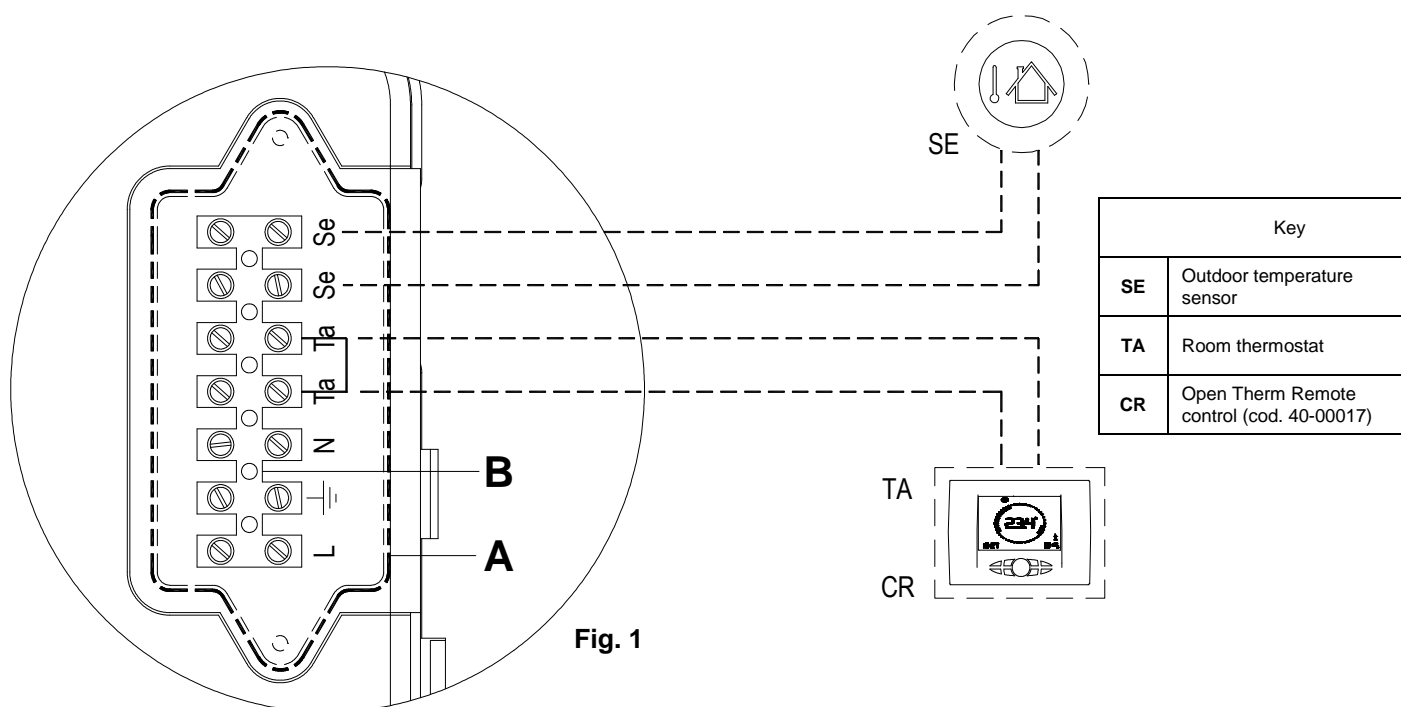




## 6.7 Electrical connections (Option)

**Connect the power supply to the terminal board located onto the control panel as follows:**

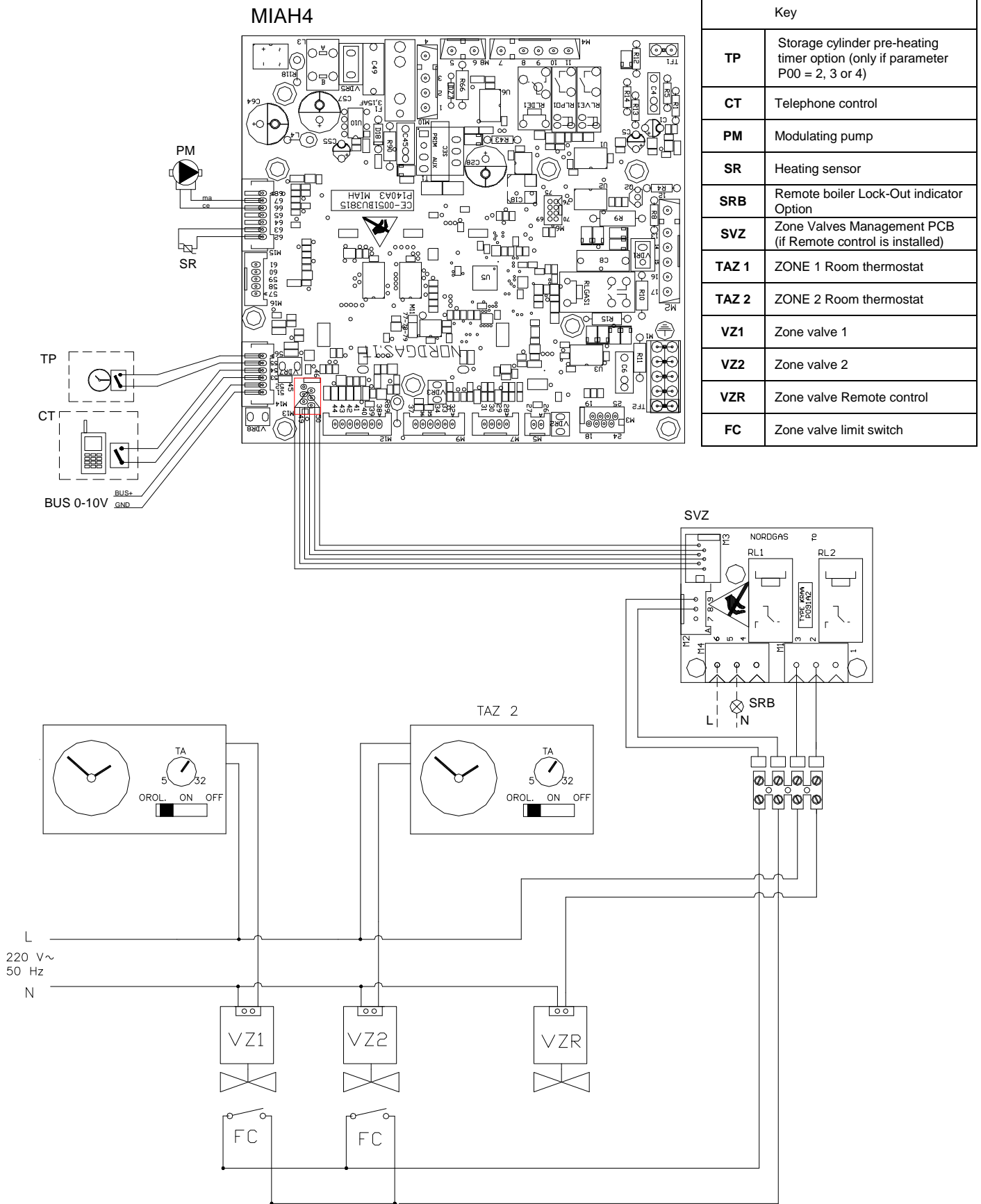
- switch off the power supply at the main switch;
- remove the front case panel of the boiler. (see paragraph '6.3 Accessing the boiler');
- slacken the screws and remove plate A from the control panel (see fig. 1). With the plate removed, proceed with the following wires connection:
  - of the outdoor temperature sensor on contacts marked as **Se-Se** on the terminal board "**B**";
  - of the room thermostat or telephone control removing the jumper **Ta-Ta** from the terminal board "**B**" first, and then connecting the room thermostat/telephone control wires;
- When wires have been connected, place plate "**A**" back to position and then the front case panel.




In case of a simultaneously outdoor temperature sensor and remote control installation, the printed circuit board sends the outdoor temperature value to the remote control only, without using it for the modulation.

The communication between the printed circuit board and the remote control happens separately from the boiler functioning mode selected and, once the connection has been established, the user interface on board is disabled and displayed by the symbol '⌂'.

## Wiring diagrams:



## 6.8 Troubleshooting

To display the last 5 errors, keep pressed the 'ⓘ' INFO button, in OFF mode position, for 5 seconds. The errors number will appear in chronological order (-1- = first fault... -5- = last fault). Use '⊕' and '⊖' buttons of  Heating Temperature setting, to scroll the list of saved errors. To reset the errors list press the 'Ⓜ' RESET button. Press the 'ⓘ' INFO button to exit the errors display mode.

ERROR CODE	PROBLEM	POSSIBLE CAUSE	REMEDY	RESET
<b>E01</b>	IONISATION PROBLEM	<p><i>WITHOUT FLAME IGNITION</i></p> <p>a. NO GAS. b. IGNITION ELECTRODE BROKEN OR EARTHED. c. GAS VALVE MALFUNCTION. d. IGNITION SEQUENCE SET TOO LOW. e. GAS VALVE INLET PRESSURE TOO HIGH (FOR LPG BOILERS ONLY).</p> <p><i>WITH FLAME IGNITION</i></p> <p>f. POWER SUPPLY LINE AND NEUTRAL CABLES REVERSED. g. IONISATION ELECTRODE MALFUNCTION. h. IONISATION ELECTRODE CABLE DISCONNECTED.</p>	<p>a. CHECK MAINS GAS SUPPLY. b. REPLACE PART. c. REPLACE PART. d. SET THE IGNITION SEQUENCE. e. CHECK THE MAXIMUM GAS PRESSURE SETTING.</p> <p>f. CONNECT THE BOILER PROPERLY. g. REPLACE PART. h. CONNECT THE IONISATION ELECTRODE CABLE.</p>	Manual Reset (press the 'Ⓜ' Reset button)
<b>E02</b>	SAFETY THERMOSTAT TRIPPED (95°C)	<p>i. THERMOSTAT MALFUNCTION OR OUT OF CALIBRATION. j. THERMOSTAT CABLE DISCONNECTED.</p>	<p>i. REPLACE PART. j. CHECK THE WIRING.</p>	Manual Reset (press the 'Ⓜ' Reset button)
<b>E03</b>	102° C THERMO FUSE TRIPPED	<p>k. THERMO FUSE BROKEN. l. THERMO FUSE CABLE OR POWER SUPPLY DISCONNECTED.</p>	<p>k. REPLACE PART; l. CHECK THE WIRING AND THE POWER SUPPLY CONNECTION.</p>	Manual Reset (press the 'Ⓜ' Reset button)
<b>E04</b>	NO WATER IN THE SYSTEM	<p>m. INSUFFICIENT WATER PRESSURE IN THE SYSTEM (STOPS AT 0.3 BAR). n. WATER PRESSURE SWITCH CABLE DISCONNECTED. o. WATER PRESSURE SWITCH MALFUNCTION.</p>	<p>m. FILL THE SYSTEM. n. CHECK THE WIRING. o. REPLACE PART.</p>	Automatic
<b>E05</b>	HEATING SENSOR	<p>p. SENSOR MALFUNCTION OR OUT OF CALIBRATION (RESISTANCE VALUE 10 kOhms AT 25 °C). q. SENSOR CABLE DISCONNECTED OR WET.</p>	<p>p. REPLACE PART. q. CHECK THE POWER SUPPLY CONNECTION.</p>	Automatic
<b>E06</b>	D.H.W SENSOR / CYLINDER	<p>r. SENSOR MALFUNCTION OR OUT OF CALIBRATION (RESISTANCE VALUE 10 kOhms AT 25 °C). s. SENSOR CABLE DISCONNECTED OR WET.</p>	<p>r. REPLACE PART. s. CHECK THE POWER SUPPLY CONNECTION.</p>	Automatic
<b>E15</b>	RETURN SENSOR	<p>t. SENSOR MALFUNCTION OR OUT OF CALIBRATION (RESISTANCE VALUE 10 kOhms AT 25 °C). u. SENSOR CABLE DISCONNECTED OR WET.</p>	<p>t. REPLACE PART. u. CHECK THE POWER SUPPLY CONNECTION.</p>	Automatic
<b>E16</b>	FAN	<p>v. BURNT w. POWER SUPPLY CABLE <b>MALFUNCTION</b></p>	<p>v. REPLACE PART. w. REPLACE PART.</p>	Automatic

ERROR CODE	PROBLEM	POSSIBLE CAUSE	REMEDY	RESET
<b>E18</b>	INADEQUATE CIRCULATION	<b>x.</b> PRIMARY OR SECONDARY HEAT EXCHANGER OBSTRUCTED. <b>y.</b> PUMP MALFUNCTION OR PUMP IMPELLER DIRTY.	<b>x.</b> CLEAN OR REPLACE PART. <b>y.</b> CLEAN OR REPLACE PART.	Automatic
<b>E21</b>	GENERAL PCB MALFUNCTION	<b>z.</b> MICROPROCESSOR MALFUNCTION: IT DETECTS A WRONG SIGNAL .	<b>z.</b> THE PCB RESETS AUTOMATICALLY THE ERROR.	Automatic
<b>E22</b>	PARAMETER PROGRAMMING REQUEST	<b>aa.</b> LOSS OF MICROPROCESSOR MEMORY.	<b>aa.</b> REPROGRAM PARAMETERS.	Manual Reset (Switch off the power supply)
<b>E35</b>	FLAME DETECTION MALFUNCTION	<b>bb.</b> IONISATION ELECTRODE MALFUNCTION <b>cc.</b> IONISATION ELECTRODE CABLE MALFUNCTION <b>dd.</b> PRINTED CIRCUIT BOARD MALFUNCTION	<b>bb.</b> REPLACE OR CLEAN PART <b>cc.</b> REPLACE PART <b>dd.</b> REPLACE PART	Manual Reset (press the '®' Reset button)
<b>E40</b>	ELECTRIC POWER SUPPLY	<b>ee.</b> ELECTRIC POWER SUPPLY OUT OF THE OPERATION RANGE ( $\leq 160$ / $\geq 285$ volts)	<b>ee.</b> CHECK THE POWER SUPPLY NETWORK (THE ERROR DISAPPEARS AUTOMATICALLY WHEN THE POWER SUPPLY IS BACK WITHIN THE REQUIRED RANGE)	Automatic

## 6.9 Function codes

Code	Function	Description
<b>F07</b>	Flue test function active (Chimney-Sweeper)	Pressing '®' button for 7 seconds the Flue test function is enabled. Pressing the boiler Off button the function is disabled. The Flue test function operates the boiler at the maximum heating pressure for 15 minutes without any modulation. The function is useful for combustion testing.
<b>F08</b>	Frost Protection function (Central heating circuit)	The function is automatically enabled when the heating sensor detects a temperature of 5 °C. The boiler operates at minimum gas pressure with the diverter valve in the 'winter' position. The function is disabled when the temperature detected by the sensor reaches 30°C.
<b>F09</b>	Frost Protection function (D.H.W circuit)	The function is automatically enabled when the D.H.W sensor detects a temperature of 4 °C. The boiler operates at minimum gas pressure with the diverter valve in the 'summer' position. The function is disabled when the temperature detected by the sensor is 8 °C in the D.H.W circuit or 30 °C in the central heating circuit.
<b>F28</b>	Legionella Prevention Function	Function active for storage boilers only. It comes into operation every 7 days. It brings the hot water temperature of the storage cylinder up to 60°C whatever temperature value is set for hot water.
<b>F33</b>	System purging function	The function is automatically enabled at the first ignition of the boiler. The boiler operates a series of cycles for a period of 5 minutes. Each cycle consists in: the pump is enabled for 40 seconds and then disabled for 20 seconds. The starting of the boiler is only allowed at the end of this function. In case of an open contact of the water pressure switch, this function can be enabled during the normal boiler operation. Once the contact is closed a purging cycle of 2 minutes is performed.

## 6.10 Parts List

### Main components

CODICE	DESCRIZIONE
25-00196	WATER PRESSURE GAUGE
25-00283	EXPANSION VESSEL 7 l.
25-00299	PUMP UPSO 15-60 CIAO AOKR
27044LA	CONDENSATE TRAP
30-00043	CONDENSING EXCHANGER 5+1 CBD COMPLETE
36076LA	ELECTRONIC GAS VALVE COND. 1/2" M - VK4115V1378B
36068LA	VENTURI MANIFOLD
37032LA	FAN
40-00077	PRINTED CIRCUIT BOARD DIGITECH CS – MIAH4
59015LA	WATER PRESSURE SWITCH
31368LA	D.H.W / HEATING SENSOR CABLE 8 m
73516LA	HTG CLIP SENSOR FOR PIPE 17/18 mm BLUE
73517LA	THERMO FUSE 102°C RED
86006LA	SAFETY THERMOSTAT 95 °C
88023LA	IGNITION TRANSFORMER
96005LA	SAFETY VALVE SS/M 1/2" 3ATM
96031LA	3-WAY VALVE ALCOW



Heating technology since 1959

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